

2 July 1979

WORLDWIDE REPORT  
NUCLEAR DEVELOPMENT AND PROLIFERATION

No. 1

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NUCLEAR DEVELOPMENT AND PROLIFERATION

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MUNIR CALLS FOR WORLD COOPERATION IN N-TECHNOLOGY

Quetta BALUCHISTAN TIMES in English 22 May 79 p 1

[Text] Islamabad, 21 May. The Chairman of Pakistan Energy Commission, Mr Munir Ahmad Khan, has emphasized the need for international cooperation in peaceful uses of nuclear technology.

He was speaking at the European Nuclear Conference held jointly by the American Nuclear Society and the European Nuclear Society early this month in Hamburg, recently, a Press release here today said.

Mr Munir Ahmad Khan had been invited to present a paper to a special session on Energy Needs of Developing Countries.

He said at present a substantial transfer of raw materials and non-renewable energy resources including oil is taking place from less developed countries to the advanced countries which is not commensurate with the transfer of desperately needed technology to the developing countries. This calls for reappraisal and reversal he said.

The Chairman of the Atomic Energy Commission said that if this situation continues the oil producing less developed countries would have gravely diminished their reserves within the next years without having acquired necessary technologies for meeting their increased domestic energy needs. The poorer Third World countries will find themselves competing with far more powerful industrialized countries for diminishing oil supplies while the oil price will increase.

CSO: 5100



USSR MAY HELP INDIA PRODUCE N-PLANT PARTS

Calcutta THE STATESMAN in English 23 May 79 p 9

[Text]

NEW DELHI, May 22.—The Soviet Union is likely to help India manufacture equipment for atomic power stations, reports UNI.

The possibility of Indo-Soviet cooperation in this field was discussed by the public sector Heavy

Engineering Corporation and Soviet organisations in Moscow recently.

Soviet experts are expected to visit India for further detailed discussions in this regard. A protocol signed by India and the Soviet Union envisages cooperation in this field during 1981-85. It also envisages the supply of more than 4,000 tons of HEC equipment to the Soviet Union during the period.

The Soviet orders are for the supply of 1,750 tons of frames, armours, doors for coke batteries, 750-1,000 tons of heavy steel castings for industrial mills, 800 tons of forgings, 500 tons of spares and components for denaflores and fraction separators and 400 tons of parts for coke machinery and equipment.

The protocol says a Soviet team will visit India shortly to explore possibilities of placing additional orders for metallurgical equipment like rolling, continuous casting machines, ore-bridges, reloaders and ore stacker-reclaimers.

The protocol anticipates HEC supplying 100,000 to 125,000 tons of equipment for the Soviet-aided steel plant at Visakhapatnam. Substantial orders are also expected from the Soviet Union for the supply of equipment for the modernisation of the Bhilai Steel Plant during the period.

Under consideration is the question of HEC taking up the manufacture of strip welding machines for hand-facing of large bells of blast furnace charging devices.

FRANCE, FRG PLAN URANIUM EXPLORATION IN GUYANA

Georgetown GUYANA CHRONICLE in English 18 May 79 p 16

[Text] Guyana yesterday signed a second agreement for the search for uranium here in just under three months. The new agreement with the West German firm of Grundstoff Technik is on very similar terms as the one signed with the French firm of Cogema in February this year.

And as the search here for the white, metallic radioactive element which is the chief source of atomic energy is stepped up, sources disclosed yesterday that Cogema is about to set up permanent offices in Georgetown to form the base of its operations here.

They said Cogema's manager for its South American operations, Mr. Jean-Pierre Mazeas, was due here by the end of next week to set the arrangements for the establishment of its offices. At least three geologists, supported by a full-fledged exploration staff, are expected to form the base of the operations by the firm here over the next three years.

Programme

Mr. Mazeas is to be here initially for one week and Cogema's permanent offices are expected to be well-established by the end of the month, according to the sources.

They explained that like Cogema, Grundstoff Technik, will first of all map out their work programme here and then on the basis of preliminary findings, step up the search if this is determined.

The Geological Surveys Department of the Ministry of Energy and Natural Resources will be carrying out contract work for the companies and will work in close liaison with them under the agreements. In areas where the local department lacks the necessary equipment and expertise, the companies will provide these, including geo-chemical facilities and modern detecting equipment.

The agreement signed between the Guyana Government and the West German firm yesterday, also like the one signed with Cogema, is essentially a non-exclusive contract covering no specified tract of land. The sources said they were general exploration permits to look for uranium in Guyana and they disclosed that although no areas were specified, the general search for the metal was being conducted in the Pakaraima Mountain range, the Takutu mountains and other parts of the Rupununi.

After a first year assessment of the uranium potential here, the companies will then decide if they want to get involved in ground work and at the end of three years of work, Grundstoff Technik would be entitled to retain 11,450 square miles for its exclusive use.

The agreements also provide for joint ventures between the individual companies and the Guyana Government if they decide to explore and exploit the metal.

Signing yesterday's agreement for the Guyana Government was Energy and Natural Resources Minister Hubert Jack while the consular for the Federal Democratic Republic of Germany here, Mr. Winfried Fries, signed on behalf of the West German firm.

Acting Permanent Representative of the European Economic Community in Guyana, Mr. Signar Schmidt, witnessed the signing.--SHARIEF KHAN

CSO: 5100

# HOW AUSTRALIAN CO-OPERATION IN URANIUM ENRICHMENT SUGGESTED

EXCERPT FROM THE AUSTRALIAN in English 2 May 79 p 11

[Article by Ian Jerkin: "Germans Offering Their Technology for Our Resources"]

[Text]

THE successful introduction in Australia of a major coal liquefaction industry - coal-to-oil - could substantially lift local technological and manufacturing capabilities.

This was indicated to a meeting of the Australian German Association by the West German Ambassador to Australia, Dr Horst Biomeyer-Bartenstein.

The Ambassador told the meeting the West German Government had recently introduced a special program aimed at encouraging smaller German companies to acquire technology which could be used jointly with overseas groups.

German firms which obtained knowhow in this way could use it in joint ventures with Australian firms, he said.

"Besides this transfer of technology on a small scale, we are already working together with the Commonwealth and three State Governments on what amounts to a transfer of technology on a large scale.

"I am referring here to the joint feasibility study on coal liquefaction.

"The study is now firmly on its way, and if successful - of which we have no doubt -

Australia would obtain access to a higher form of technology than hitherto used here.

"Australia would be able to manufacture up to 80 per cent of the needed plants and equipment for such an operation."

Dr Biomeyer-Bartenstein added that other areas in which Australia and Germany could co-operate in the transfer of technology, were uranium enrichment and solar energy.

"While the study in this area is just beginning and is very complex, it could become of enormous importance to Australia in its endeavor to upgrade its resources before exporting them," he said.

"We all know, of course, that many problems would have to be overcome in the light of recent developments in the nuclear power industry.

"In this context, the beginning of co-operation between Australia and Germany in the area of solar energy is noteworthy."

After a joint seminar in Germany, conducted within the framework of the agreement on scientific and technological co-operation, a memorandum of understanding has recently been signed between Western Australia and a German firm.

Dr Blomeyer-Bartenstein said the two other potential areas of co-operation between Australia and West Germany were mining and manufacturing.

Germany, as a big importer of raw materials for use by its manufacturing industries, needed reliable suppliers: Australia, with its wealth of minerals and ores, the extent of which was not yet fully known, was such a supplier.

Dr Blomeyer-Bartenstein said this had been proven in the case of bauxite, where Germany obtained about 60 per cent of its requirements from Australia.

"Increasing sales of iron ore have brought Australia to the number three position, which is quite a success," he said.

"Nickel and other ores and concentrates are further examples. In the medium term, Germany's requirements for energy resources in the form of coal and uranium will grow.

"In these cases, too, Australia can become an important supplier.

"In fact, the first German equity participations in mining projects have taken place in these resources.

"Besides these projects, a fair deal of exploration is being carried out.

"In addition to its role as buyer of Australian mining products, Germany helps the Australian mining industry by making available high-quality mining equipment.

"We also have proven technology for the upgrading of Australian raw materials, for example, direct reduction of iron ore, among others.

"In the manufacturing sector, interest has been expressed in joint ventures with Australian firms.

"The exact areas or projects would have to be determined," he said.

## BRIEFS

TURKISH-SOVIET ECONOMIC PACT--Ankara, June 7 (XINHUA)--Turkey and the Soviet Union have signed an economic cooperation agreement which covers twenty projects, the press here reported today. The agreement was signed here on June 5 after a week-long discussion at the fourth meeting of the joint economic cooperation commission of the two countries. Under the agreement, the Soviet Union will help Turkey build a 400 MW nuclear power station and provide fuel for the reactor. The Soviet Union will also explore for oil and natural gas in Turkey, and increase its electricity supply to Turkey to 2,400 million kWh through an additional transmission line. The Soviet Union also promised to provide Turkey with more oil this year to be repaid with wheat and other commodities. [Text] [Beijing XINHUA in English 0346 GMT 8 Jun 79 OW]

CSO: 5100

AUSTRALIA, SOUTH KOREA SIGN NUCLEAR SAFEGUARDS AGREEMENT

Melbourne THE AGE in English 3 May 79 p 12

[Text]

CANBERRA. — The South Korean nuclear power programme offered a potential market for Australian and other uranium suppliers of 80,000 tonnes by the year 2000, the Deputy Prime Minister, Mr. Anthony, said yesterday.

He was speaking at the signing of an Australia-Korea nuclear safe-guards agreement with the South Korean Prime Minister, Mr. Choi Kyu Hah. Australia also has agreements with Finland and the Philippines.

The South Korean uranium market, on Mr. Anthony's figures, will involve purchases of more than \$6000 million.

Mr. Anthony said uranium sales would become a significant part of Australia's trading relationship with South Korea.

The agreement incorporated all the requirements announced by the Prime Minister in May 1977, Mr. Anthony said.

The purpose was to ensure that when Australia supplied uranium for peaceful purposes it would not be diverted to non-peaceful or explosive uses.

Spokesmen for the Movement Against Uranium Mining and Friends of the Earth said the nuclear safeguards agreement would lead to Australia encouraging and supporting South Korea's ill-conceived and unsafe nuclear programme.

From TONY THOMAS

Korea's record of nuclear operations was poor. The country's only reactor had seen a series of problems.

They said the reactor, built with Westinghouse Electric Corporation technology, was so full of defects that 66 per cent of the reactor had to be replaced. In March, the reactor had to be closed for nine days after a radiation leak.

The groups said the South Korean's like the Filipinos, were unable to protest against plant construction.

South Korea wanted to obtain nuclear weapons. An agreement with France about plutonium recycling was called off at the last minute in 1976 because of international pressure, the two groups said.

Mr. Choi Kyu Hah told a National Press Club lunch that the allegedly leaky nuclear reactor was going very well. South Korea had no intention of making nuclear weapons.

Australia had an obligation to supply its uranium to these countries.



## WEST AUSTRALIA TO HAVE NUCLEAR POWER STATION BY 1995

### Government, Opposition Positions

Canberra THE AUSTRALIAN in English 3 Apr 79 p 1

[Text]

THE West Australian Government is determined to go ahead with its plans for a nuclear power station despite the disaster at the Harrisburg atomic plant in the U.S.

The Premier, Sir Charles Court, said yesterday the incident would not influence his Government's policy to have a nuclear power station in operation by 1995.

Sir Charles made his statement as the Prime Minister, Mr Fraser, prepared to discuss the full implications of the U.S. disaster at today's Federal Cabinet meeting.

The Federal Government is receiving twice-daily briefings from the U.S. on the situation at Harrisburg, and Australia's atomic energy counsellor in Washington, Dr R. J. Knight, is flying to the crippled plant for an on-the-spot examination.

The Minister for National Development, Mr Newman, is expected to face close questioning from the Opposition on the implications to Australia's nuclear industry when Federal Parliament sits this afternoon.

Last night the Leader of the Federal Opposition, Mr Hayden, said the Harrisburg situation confirmed an urgent need for Australia to set up an independent nuclear regulatory authority.

### 'CLEAR CONFLICT'

He said such an authority should advise the Government and Parliament on safety, security and safeguards on both nuclear power generation and the supply of nuclear materials.

Mr Hayden said there was a clear conflict of interest within the Atomic Energy Commission between its role as a promoter of nuclear power generation and its function as an adviser on safety and security.

The decision by Western Australia to press ahead with its nuclear plans has brought an immediate outcry from the State Labor Opposition, which served notice that if it gained power it would cancel any plans to build such a plant.

The West Australian State Energy Commission is working on a plan to have the proposed atomic power station built at Ledge Point, 100 km north of Perth.

Sir Charles said yesterday details would be ready by 1986.

He added that a lot of emotion was being generated by the Harrisburg incident among people opposed to all nuclear development.

"On the information available to me, the situation at Harrisburg has not created the real danger the headlines would indicate," he said.

## Commissioner's Study Trip

Perth THE WEST AUSTRALIAN in English 7 Apr 79 p 3

[Text] The WA Energy Commissioner, Mr J. B. Kirkwood will leave Perth tomorrow to make a major study of nuclear power developments, including the latest methods for waste disposal.

The Government plans to have a nuclear power reactor in WA by the mid 1990s.

He will visit Germany, France, Britain and Sweden to see uranium enrichment plants and nuclear power stations and examine licensing, safety, and environmental aspects.

It also hopes that a study of possible sites for the station will be completed in the next few months.

The Premier, Sir Charles Court, has said that the Harrisburg nuclear accident would not deter the Government from proceeding with its plans.

Sir Charles said last night that Mr Kirkwood's study would help to ensure that the Government received the latest available information on siting nuclear power stations and related matters.

Mr Kirkwood is also chairman of the National Energy Research Development and Demonstration Council.

The Federal Minister for National Development, Mr Newman, had asked Mr Kirkwood in this capacity to head a review of the future role of the Australian Atomic Energy Commission's research establishment at Lucas Heights near Sydney.

Mr Newman had announced the review in November last year. The work was well advanced.

The review committee included Dr R. G. Ward, general manager of research and new technology at BHP, and Dr J. L. Farrands, the secretary of the Department of Science and Environment.

## Research

Sir Charles Court said that Mr Newman had emphasised that Lucas Heights would continue as Australia's prime nuclear research centre.

But he had raised the possibility that the extensive human and physical resources available at the establishment could be turned to a broader range of energy research.

The Lucas Heights review and Mr Kirkwood's overseas inspection would fit in well with WA's own nuclear studies.

Sir Charles said that Mr Kirkwood would visit solar equipment manufacturers in Italy and West Germany.

Some of the companies he would inspect already had submitted proposals to the State Energy Commission for supplying equipment as part of an investigation into supplying power to remote areas.

NEWSPAPERS ASSESS SIGNIFICANCE OF HARRISBURG ACCIDENT

'COURIER MAIL' Comment

Brisbane THE COURIER-MAIL in English 2 Apr 79 p 4

[Editorial: "Glimpse of a Nuclear Horror"]

[Text]

**T**HE radioactive gas leak from Three Mile Island plant in Pennsylvania should jolt the world into a new awareness of the danger of nuclear disaster.

After more than 30 years of high safety performance this nuclear accident has given a glimpse of the science horror that these plants could unleash.

The incident certainly will spark world argument, in which Australia has a vital interest.

This country now produces only a comparatively small amount of uranium, but has some of the world's biggest and richest deposits of the nuclear fuel.

After years of debate the Government is pushing ahead with plans to develop the mighty Ranger uranium deposit in the Northern Territory.

The Pennsylvania crisis no doubt will give impetus to the anti-nuclear lobby. Some will want to stop all uranium development on the ground that it will lead to self-destruction.

The other extreme will argue that nuclear plants are essential in the face of declining world energy supplies.

Between these extremes there is room for the approach that we should not go back, that we should learn from our mistakes. This would mean immediate world review of the already stringent controls.

Many Australians will hope that the final solution might lie with new techniques to produce a cheap, compact form of solar power.

'SYDNEY MORNING HERALD' Comment

Sydney THE SYDNEY MORNING HERALD In English 2 Apr '79 p 6

[Editorial: "Harrisburg"]

[Text]

NO FINAL judgment of the implications and significance of the accident at Harrisburg can or should be made while the outcome remains uncertain and until its causes have been fully investigated. The fears of the US officials who, very properly, have alerted the nation to the more alarming possibilities of the situation, may prove unfounded. However, even if this is so, there is little doubt that the very occurrence of the accident, or series of accidents, technical and human, is bad news for the nuclear energy industry worldwide, and for the many Governments who are relying on it to meet the energy shortfalls expected to develop over the next quarter of a century.

For more than 20 years, ever since the first nuclear power stations began operating, leading nuclear scientists have been assuring critics and sceptics that a major disaster — such as the "meltdown" which is a possibility at Harrisburg — though theoretically possible, could hardly occur in practice, so stringent are the security precautions against all conceivable mishaps. Now the inconceivable—a combination of circumstances not even visualised in computer studies—has happened. The worldwide anti-nuclear movement will be the stronger as a result.

It is already strong — in the West, at any rate, if not in the communist countries, such as Russia and China, which are also committed to nuclear power. It

has brought down a Government in Sweden and, through a referendum, closed a new power station, before it could operate, in Austria. There have been serious anti-nuclear riots in Germany, France and Spain. The Harrisburg accident seems bound to give the movement new impetus as well as a more precise target. Until now the main ammunition against nuclear power has been directed at the problems of the disposal of nuclear waste and the security of the plutonium—an essential ingredient of nuclear weapons — which will be manufactured in increasing quantities, widely dispersed, by the new generation of fast-breeder reactors. Now the security of power stations themselves will come under heavier fire.

The bad news for Governments is not only the political fall-out from Harrisburg. They have answers to this, notably, as Mr Anthony has pointed out, the bleak statistics of the emerging energy shortage. However the Harrisburg investigation may well compel a new and more costly approach to security; this, at a time when the economics of nuclear power are looking less attractive than they did in the 1950s and 1960s. If the result of Harrisburg is second thoughts on the feasibility as well as the safety of nuclear power, the hopes centred in Australia in uranium mining could be disappointed. Certainly Australians will expect Mr Fraser to inform himself fully about Harrisburg and its implications and report to Parliament as soon as possible.

## HARRISBURG ACCIDENT IMPLICATIONS FOR AUSTRALIA ANALYZED

Santerre THE AUSTRALIAN in English 3 Apr 79 p 9

[Article by chief political correspondent Malcolm Colless: "Australian Political Implications"]

[Text]

**T**HE reactor crisis at Harrisburg in the United States has rekindled nuclear power as a political issue — and the implications are certain to hit Australia.

The fact that such an incident could happen, let alone the possibility of a nuclear explosion, poses a dilemma for the Labor movement and the Federal government.

Addressing the last ACTU Biennial Congress in Sydney in 1977, its president, Bob Hawke, put the union movement's position in a nutshell when he said: "We are divided. There is no commonality of view."

As the ACTU heads towards its next Congress in September, it's clear that this has not changed although the Harrisburg incident will strengthen the stand of the anti-uranium unions. As the mining companies move steadily towards a start to uranium development in Australia, so the divisions within the union movement become wider.

A planned ACTU nuclear fact-finding mission to West Germany and other European countries fell through recently, with

the organisation's senior vice-president Cliff Dolan telling the ACTU executive that he would not be available to lead the team.

Later Mr Dolan's union — the Electrical Trades Union — and the giant Amalgamated Metal Workers and Shipwrights' Union told the Arbitration Commission that they would not be interested in any award coverage for their members in the uranium industry.

But this has not held back the scramble by several other unions for a share of the lucrative wages which will be paid to employees in the industry. With the differences already clearly present in the union movement, issues such as Harrisburg could heighten tensions between the pro and anti-uranium camps.

And this could reach flashpoint if the unions opposed to uranium exploitation decide to take industrial action to stop work from going ahead.

Meanwhile the anti-uranium push within the A.L.P. will use the lessons of the Harrisburg incident to boost their case for a much tougher stand against its development.

The ALP's policy adopted at its last Biennial Conference in 1977 amounts to an indefinite moratorium centred on the absence of adequate evidence that its use is safe. The key thrust in from the the anti-uranium lobby at the ALP's next national conference in July will be to make it unmistakably clear that non-Labor government contracts will not be honored and that the only mine operating at present - Mary Kathleen - will be allowed to die.

The anti-uranium lobby is adamant that Mary Kathleen must not be propped up any longer, even to provide uranium necessary to satisfy contracts entered into by the former Labor government.

While this tough no-mining policy has the support of several unions it clearly puts additional strain on relationships between the ALP and those unions which are negotiating at present to get a piece of the action.

The Federal government has locked itself into a pro-uranium position which hinges primarily on the enormous wealth to Australia of the development of this natural resource. Up to now the protective cover it has thrown around this policy has concentrated on the possibility of abuse of our uranium by overseas clients, and waste disposal.

But Harrisburg raises a new element - the prospect that with all these things being taken into account something can still go wrong. The government has ordered its nuclear expert attached to the Australian Embassy in Washington, Dr R.J. Knight, to go to Harrisburg and examine the situation first hand.

His report will be vital to Cabinet's assessment of its future nuclear policy. In the run-up to the 1977 election, it managed to use the nuclear row as a handy political weapon against its opponents who were spurred on by anti-uranium forces.

With another election not too far away, it would certainly not want to find itself losing out over this issue if public feeling starts running hot.

At the same time and despite the Harrisburg incident it will come under steady pressure by industrialists not to flinch from its committed position. Only yesterday the Chairman of BHP, Sir James McNeill, put this view quite clearly when he pointed out that to meet the projected requirement of nuclear power stations by the year 2000 it would be necessary to commission about seven stations a month in the 15 years from 1985 each with a capacity of 1000 mw.

This calculation made no allowance for the replacement of nuclear power stations.

## AUSTRALIA

### DIFFERENCES IN HARRISBURG, AUSTRALIAN REACTORS EXAMINED

#### Australian Reactor Described

Canberra THE AUSTRALIAN in English 3 apr 79 p 9

[Article by Philip Cornford: "The Doomsday Stakes: Our Reactor a 'Pipsqueak' against Harrisburg"]

[70X1]

**A**S FAR as nuclear reactors go, the Australian Atomic Energy Commission's neutron bombardment plant at Lucas Heights, NSW, is a pipsqueak.

When it has finished splitting uranium atoms, the reactor's electricity output of 10 kilowatts is equivalent to the same that would be produced by 10 family V8s driving along a city street.

And that is one of the essential differences in the Doomsday stakes between 18-year-old HIFAR, Australia's only reactor in full-time use, and the huge nuclear plant at Three Mile Island, Pennsylvania, now facing the crisis of a possible meltdown.

At Lucas Heights yesterday, basking peacefully in the autumn sun amid gentle bushland 30km south of Sydney, where scientists and HIFAR are doing the basic research for Australia's arguable advance to power generation, no-one — understandably, considering the

confusing information available and the emotive issues raised — was willing to discuss the catastrophe in Harrisburg.

The Director, Professor Stuart Butler, and the deputy director of operations, Dr. Grant Miles, however, were prepared to compare hardware.

Their verdict: a similar breakdown at HIFAR is not impossible — scientists quite some time ago gave up using the word — but it is very, very improbable.

HIFAR was shut down yesterday while four of its U235 and U238 fuel rods were replaced — and therein lies another essential difference between the Australian research reactor, whose secondary role is to produce radioactive isotopes for medicine, science and industry, and the Harrisburg plant.

The Lucas Heights reactor has 25 such rods, containing a total uranium mass of only four kilos.

The American reactor has a uranium mass of 81,000 kilos fueling its furnace heart. The difference is critical.



**A**USTRALIA'S second reactor, MOATA. Aboriginal for gentle heat or fire-stick, did not even come into consideration.

It is fuelled by three kilos of uranium and produces only 100 kilowatts, equivalent to one-tenth of the heat put out by a one-bar electric radiator. It is used part-time for experimental work.

HIFAR is cooled by heavy water, 280,000 gallons of it an hour. In heavy water, the hydrogen atoms are replaced by a heavier hydrogen isotope called deuterium. HIFAR has a back-up system of 270,000 gallons an hour of normal tap water. The American plant is cooled by normal water.

The use of heavy water, 10 times the density of normal water, gives HIFAR two advantages. The water acts as an atomic "brake," slowing the speed of a neutron from 16,000km a second when an atom is split, to under 2km a second. And this in turn allows the control of the atom-splitting process, which is the fierce heat-generating element of a nuclear reactor.

With the neutron bombardment under control, the temperatures at which HIFAR operates are minimised. The heavy water enters the core at 44 degrees C., and comes out at 51 degrees.

In the Harrisburg plant, with a high intensity of atom-splitting needed to generate the reactor's output of 2772 megawatts of electricity, the coolant comes out of the core superheated to 300 to 400 degrees C.

Thus any failure in the cooling system — which happened — will send the temperatures racing more quickly to the level (around 600 degrees Celsius) at which the uranium rods and their

aluminium protectors will melt into a molten and potentially deadly mass.

Professor Butler said: "The vital difference is that we are not engaged in electricity production. We don't have a high-temperature, high-pressure operation."

But, although improbable, a similar failure at HIFAR is not impossible.

Dr. Miles scratched his knowledgeable head yesterday, suspended belief for a few seconds, and came up with a scenario. The point has to be made that no-one at Lucas Heights gives it a ghost's chance of happening. However...

The 30cm diameter pipe of 2cm thick stainless steel pipe which carries the heavy water coolant would have to be broken.

This pipe has leaked before, spilling drops of radioactive water but the pollution effects, says Dr. Miles, were minuscule, well below recommended safe levels.

But he is not talking about a leak. "It would have to be a complete break — and it would take a stick of gelignite to do it — that would stop the flow of heavy water completely," he said.

Six control rods would automatically shut down the reactor. Fission would cease. The normal water system, which also cools the heavy water, would flood the inner core, inundating the fuel rods.

In effect, this is what happened at Harrisburg, and it worked at first, until the hydrogen bubble that was formed by electrolysis of the oxygen and hydrogen elements of the water insulated the uranium rods, and sent their temperatures rising alarmingly.

If the back-up normal water system worked at HIFAR, there would be no



crisis because of the small uranium mass and lower operating temperatures. The Domsday scenario requires that this fail also.

Then the temperature of the 25 fuel rods would begin to rise quickly, fired by the heat produced by the inherent radio-activity of the rods. No fission process would be required.

Uncooled, the system would melt down within hours.

Despite the fact that the inner core is insulated by carbon, a 8cm thick lead shield and nearly 2m of concrete, dangerously radio-active gases would escape, probably down the broken, heavy water pipe.

The escaping gases, followed by other air-borne radioactivity, would be diluted as it met a greater air mass. But it would again escape, this time through leaks caused by electric fittings and via the ventilation vents.

People in the area would be evacuated. The pollution would continue until the leaks were sealed.

As for the reactor, it would be finished for evermore. They'd probably fill it up with concrete.

If it happened, Australia would have its own mini-Harrisburg to worry about.

If...?

**FOOTNOTE:** While debate on uranium mining and the possibility of Australia getting its own nuclear generation plant rages, the Atomic Energy Commission apparently sees the die as already cast. A booklet on HIFAR says: "From HIFAR, our engineers, scientists and technicians are gaining valuable experience for the type of problems they will inevitably face, on a larger scale, when nuclear power stations are built in Australia." Note the words INEVITABLY and ARE...

#### Parliament Reassured

Brisbane THE COURIER-MAIL in English 5 Apr 79 p 31

[Text] Canberra.--The National Development Minister (Mr. Newman) said there should be no public concern about safety at the Atomic Energy Commission's research reactor at Lucas Heights in Sydney.

He told Parliament in question time that the safety of the Lucas Heights reactor had never been compromised.

"Safety receives the highest priority of all things that are under consideration by the authorities who run the reactor," Mr. Newman said.

"No member of the public should be worried about the operations of the reactor."

The Minister was replying in question time to the Opposition Whip (Mr Johnson) who cited public concern over a possible disaster or terrorist act, and over discharge of radio-active material from the plant.

Mr Newman said that discharges from the plant, for example into the Woronora River, met New South Wales Health Commission standards.

### Cost study

Mr Johnson also asked if the Government had begun a design cost study for a new reactor to replace the HIFAR reactor now operating at Lucas Heights.

Mr. Newman replied that the question of a replacement reactor was still under consideration, and no design briefs had been issued.

The Opposition spokesman on energy matters (Mr. Keating) said a Federal Labor Government would never allow the West Australian Government to build a nuclear power reactor in the State.

### Media

An A.L.P. Government would have access to a wide range of powers, including those under the Atomic Energy Act and the Customs regulations, to stop such a development, he said.

However, the powers it eventually decided to invoke would depend on circumstances at the time.

The Queensland Gov-

ernment yesterday blamed a sensation-seeking media and anti-uranium agitators for unnecessary panic over the Three Mile Island nuclear plant accident in the United States.

The Energy Minister (Mr. Camm) answering on behalf of the Premier (Mr. Blakie-Petersen) in Parliament said the credibility of the nuclear industry was extremely high.

He said it might emerge stronger than ever as a result of experience from the malfunction at Harrisburg in the United States.

He was replying to Mr. Fournas (ALP, South Brisbane) who asked if the safety of nuclear power plants had been over-sold with quotes that serious accidents were a 'million-to-one' shot.

# IMPACT OF HARRISBURG INCIDENT ON AUSTRALIA ASSESSED

Melbourne THE AGE in English 3 Apr 79 p 11

[From David Broadbent in Canberra]

[Text]

**T**HE Harrisburg crisis has forced the Australian uranium mining industry into a painful reassessment of its prospects of selling our huge supply of uranium ore.

Even if the United States experts can end the Three Mile Island nightmare without immediate loss of life, it has thrown new doubt over our prospects of selling large quantities of uranium to the US.

Projections on the profits Australia would reap from uranium exports have always been highly speculative and hotly disputed, but a steady growth in American demand has been fundamental to any forecasts.

Now, tougher and more restrictive safety requirements seem certain.

The severity of the new restrictions and the extent to which America begins rethinking the value of long-term nuclear projects might depend on the Harrisburg outcome.

But while Australian uranium industry representatives were emphasising yesterday that the Harrisburg breakdown is still an "incident" and not yet an "accident", there is no doubt that the industry is plain scared about the future of the whole US nuclear programme.

The Harrisburg breakdown came just as US uranium lobbyists started to hope for some relaxation of the safety controls and regulations hamstringing the construction of nuclear power stations in the US.

Just two months ago the US Nuclear Regulatory Commission closed down five nuclear plants. The plants had been operating safely for years but it was discovered that they might not survive the sort of earthquakes which occurs once every 20 years.

By midday yesterday the vibrations from Pennsylvania had already been felt on Australian stock exchanges. Uranium share prices slumped.

Shares in Pancontinental, the consortium sitting on our largest uranium deposits, fell from \$11.90 on Friday to close at \$10.

Pancontinental, which has yet to get Government go-ahead for mining, has been the speculating leader because its deposits are so rich and accessible.

Its share prices might recover but Australia's market prospects might not.

At this stage the industry is pinning its hopes on a quick and cheap solution to the Harrisburg breakdown and, publicly at least, is professing optimism about the future.

The Government's Uranium Export Office in Canberra yesterday chose to use "industrial confidentiality" as a reason for making no comment about the market effects of Harrisburg.

But a spokesman for the office offered the reported comments of Deputy Prime Minister and Minister for Overseas Trade and National Resources, Mr. Anthony as a cause for hope.

In Washington, Mr. Anthony said the accident would have no

long-term effect on the growth of nuclear power.

He conceded that there might be a "temporary setback" but said the US and many other countries would always have enormous energy problems.

Mr. Anthony said there were 60 nuclear power stations under construction in the US and they would require fuel.

But as a staunch Opposition opponent of nuclear development Mr. Uren, was quick to point out, that confirms a major slowing down of US nuclear progress.

It was originally estimated that by the year 2000 America would have more than 1000 nuclear plants supplying well over half the nation's energy requirements.

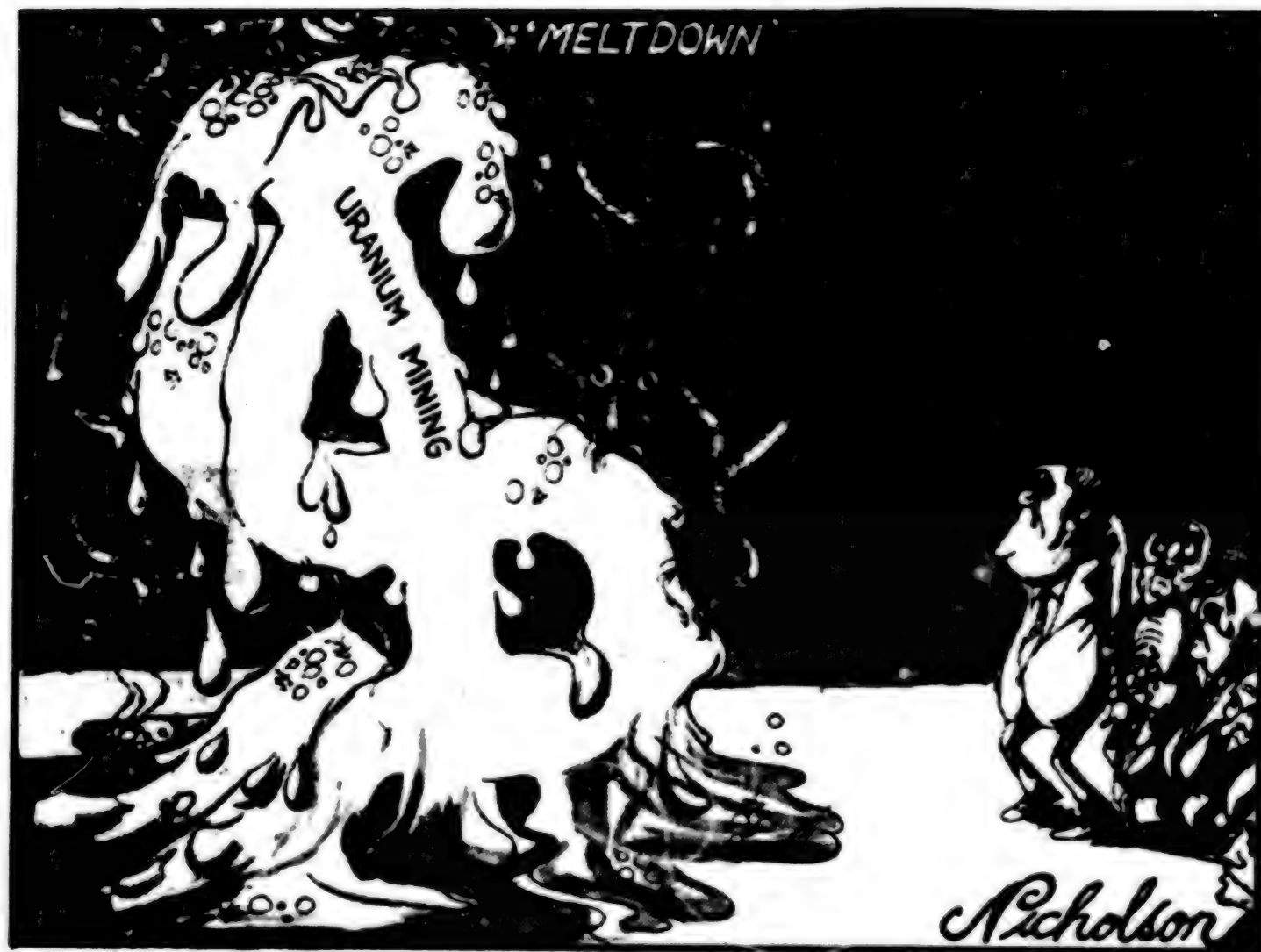
At present there are only 70 commercial plants operating in the US supplying about 9 per cent of power, and the original target would never have been reached even without the Harrisburg crisis.

And there is no doubt that the revival of the nuclear safety debate will not be confined to America.

Japan, which apart from the US and West Germany is the only country with contracts for Australian uranium, is almost certain to see a re-emergence of the safety debate.

According to a spokesman for the Australian Atomic Energy Commission, the flow-on effects from America to other nations, particularly European nations, will be negligible.

The spokesman said that Belgium, Sweden, Switzerland and



Britain already depended on nuclear power for up to 31 per cent of their electrical needs.

But despite the euphoric industry projections about exports there have been doubts about our sales prospects long before the Harrisburg crisis.

At present Australia is meeting its contractual commitment to supply Japan, West Germany and the US. This is 11,522 tonnes of uranium by 1986 from the ore stockpiled by the Mary Kathleen group at Lucas Heights, Sydney, before 1972.

This year the Federal Government has approved the start of mining at two new uranium mines, the Ranger and Nabarlek projects in the Northern Territory.

A third mine at Yallirrie, in Western Australia, is likely to be approved soon, followed closely by Pancontinental's Jabiru and Noranda's Koongarra in the Northern Territory.

Together these operations were expected to allow Australia to export about 19,000 tonnes of uranium a year by the mid-1990s.

According to the Opposition spokesman on minerals and energy, Mr. Keating, the total world market is now only 40,000 tonnes a year.

If Harrisburg turns from an incident to a disaster, Australia will not necessarily be an overall loser. Slower nuclear growth implies acceleration of coal-fired electricity generation, and that means improved demand and prices for Australian steaming coal exports.

Naturally, Mr. Anthony would have to wait an extra decade or so for his hoped for uranium enrichment industry here.

But a country as rich in coal as Australia is in the happy position of having little foreseeable need for nuclear power stations this century.

## AUSTRALIA

### AUSTRALIAN LABOR PARTY REACTS TO HARRISBURG INCIDENT

#### Call To Defer Sales

Sydney THE SYDNEY MORNING HERALD in English 4 Apr 79 p 11

[Text:]

The Federal Opposition called on the Government yesterday to defer new Australian uranium sales until the "grave risks" shown up by the Harrisburg reactor accident had been resolved.

It also repeated a call for an independent Australian Nuclear Regulatory Authority and said a Labor Government would not allow Western Australia to go ahead with plans for a nuclear power reactor.

In an urgency debate on the issue, Labor's minerals and energy spokesman, Mr P. Keating (NSW) said the need for a deferment had been shown by the Harrisburg accident and recent arrangements for sale to Japan of uranium from the Nabarlek deposit.

"The time has now come to see that these exports should not be agreed to by the Government until there is an attempt by the Government and other interested parties to see that the grave risks associated with the nuclear industry have been first resolved."

Present mining arrangements would see 6,000 to 7,000 tonnes of Australian uranium going on the market each year, lowering the price of uranium and making nuclear power a more available option.

"We have found that even the most modern reactor . . . is not safe," Mr Keating said.

He described the plans by the WA Premier, Sir Charles Court, for a nuclear reactor generating 1,000 megawatts as a "nonsense proposal."

"If Labor came to power it would never permit Sir Charles to build a nuclear power plant in WA."

"It would be a shame on the present Government if they were not to do the same thing."

His urgency motion was on "the need to ensure that no new uranium export contracts are approved by the Government until such time as the grave risks associated with the nuclear industry have been resolved."

The Minister for National Development, Mr Newman, said that nuclear energy was a fact of life.

"Nuclear energy is the only readily available alternate means countries have to meet their essential need for electrical energy in the wake of the oil crisis."

Some 21 countries — both developed and developing — had now installed nuclear power reactors and a total of 208 such reactors were now in operation.

The reactors generated a total of 107,000 megawatts of electricity, which would require 1,000 million barrels of oil a year to generate by conventional means.

Mr Newman asked if the Opposition was really suggesting that because of the Harrisburg accident, Australia should stop exporting uranium to developed and developing countries.

"Of course the answer has to be no."

"We have a clear international responsibility to develop further our uranium resources."

In agreeing to export sales of uranium, the Government had acted in an extremely responsible way, requiring buyer countries to have a responsible attitude to the operation of nuclear power plants.

He said the Australian ionising radiation advisory committee had prepared a draft report on the need for a body such as a Nuclear Regulatory authority.

The Government would also be looking very closely at the inquiry into the Harrisburg accident. If necessary it would send more officials to Washington to attend the inquiry.

The Opposition spokesman on the environment, Mr B Cohen (NSW), said the Harrisburg incident had shocked and horrified all Australians.

"The people of that area have been no more than a hair's breadth away from the disaster of a meltdown, good luck in this area is no security."

There was an inconsistency in the reports coming from the area. This proved that State officials, scientists and federal officials just did not know what was going on.

The debate lapsed.

#### Minister's Reply

From THE WEST AUSTRALIAN in English 6 Apr 79 p 12

[Text] A future Federal Labor government would be risking a constitutional crisis if it moved to prevent a nuclear power station in WA, the Minister for Fuel and Energy, Mr Mensaros, said yesterday.

The matter was clearly in the constitutional province of the State, he said.

Mr Mensaros was commenting on the statement by the Federal Opposition spokesman, Mr P. J. Keating (NSW), that a future Labor government would not allow a nuclear plant in WA.

Mr Mensaros said that WA's increasing demand for power would allow for a nuclear station by 1995.

### Contracts To Be Honored

Sydney THE SYDNEY MORNING HERALD in English 4 Apr 79 p 4

[Text] Australia will honour contracts to supply uranium to countries with nuclear power stations similar to the one which failed at Harrisburg. The Prime Minister, Mr Fraser, said this in reply to a question from Mr B. Cohen (Lab. NSW). Mr Cohen asked if the Government would consider suspending existing contracts to supply uranium to countries which use the light water pressure water reactor until it was proven there would be no recurrence of the Harrisburg episode. Mr Fraser said the short answer was "no."

### Victoria ALP Policy

Widened THE COURIER-MAIL in English 2 Apr 79 p 9

[Excerpt] Melbourne.--The Victorian Australian Labor Party conference at the week-end called on a future State Labor Government to tighten controls on uranium.

The motion asked the Opposition Leader (Mr. Wilkes) to declare during the Victorian election campaign that the State would be nuclear free under a Labor Government.

Other resolutions called for a ban on transport of nuclear materials, except for nuclear medicine, in or through Victoria.

The conference also supported the ban of nuclear powered or armed vessels from Victorian ports and a ban on facilities for nuclear warships, such as the One-on navigational aid.

#### Accident

The latter motion was forwarded to national conference for consideration because it contravenes Federal policy.

The Labor Party anti-uranium committee secretary (Mr. Ian Mill) told the conference that the nuclear accident in Harrisburg, Pennsylvania, would have a substantial impact on uranium policy.

He called on delegates to support the party's existing anti-uranium policy.



### Further Details

Source: THE AGE in English 2 Apr 74 p 6

(7-21)

The conference unanimously endorsed moves to strengthen the State branch's opposition to uranium and asked that Victoria be made a nuclear-free State.

The secretary of the party's anti-uranium committee, Mr. Ian Mill, said the decision coincided with the disaster at the Harrisburg nuclear plant in Pennsylvania.

"The reactor there is close to meltdown, which is the worst risk short of a nuclear explosion," Mr. Mill said.

"This is the sort of thing that experts tell us has only one chance in a million to occur."

Mr. Mill moved that in addition to continuing its policy calling for a total moratorium on uranium mining and export except for medical purposes, the ALP should:

- Ask the Opposition Leader, Mr. Wilkes, to include in his policy during the election campaign a call for Victoria to be declared a nuclear free State.

- Condemn the Hamer Government's attitude favoring use of public funds for studies on the feasibility of nuclear plants.

- Oppose the siting of nuclear reactors, nuclear processing and enrichment plants and nuclear waste dumps within Victoria.

- Refuse licences or assistance for uranium mining and exploration in Victoria.

- Refuse permission to any nuclear powered or armed vessel to visit Victorian ports.

CSO: 6100

## AUSTRALIA

### UNION QUESTIONING SAFETY STANDARDS AT LUCAS HEIGHTS PROJECT

Sydney THE SYDNEY MORNING HERALD in English 25 Apr 79 p 2

[By Keith Martin, Industrial Reporter]

[Text] The union covering nuclear reactor operators at the Australian Atomic Energy Commission's research establishment at Lucas Heights is concerned about staff levels and the monitoring of radiation levels at the project.

The highly-skilled operators are members of the Association of Architects, Surveyors and Draughtsmen.

The union's NSW branch industrial officer, Mr Henri Meyer, released copies of correspondence yesterday revealing for the first time that reactor operators at Lucas Heights had threatened last month not to re-start the Hilar reactor because they believed reactor control was understaffed.

At the time the reactor was shut down for refuelling and maintenance.

The threat was not carried out because more staff were soon appointed, but Mr Meyer said yesterday that the threat still existed if the reactor staff was cut again.

He said that although there are now sufficient staff to run the reactor, the union is still concerned that radiation monitoring equipment is not up to standard.

They also believed there was insufficient staff to maintain it at the high level required.

About 1,180 people work at Lucas Heights, 280 of them

members of the union in key professional and technical posts.

Correspondence released by Mr Meyer also shows that in August, 1978, the union wrote to the Minister for National Development, Mr Newman, expressing concern about the staff ceiling.

The union said the ceiling was reduced from 1,350 at June 30, 1976, to 1,290 a year later and about 1,200 by June 30, 1978.

On March 2 this year the union wrote to Mr Newman saying that it had been advised that because of a shortage of staff and severe finance limitations a broad range of fixed safety monitors and some hand monitors were not up to the standard required.

However, the letter also expressed appreciation for the decision to appoint 20 apprentices.

The letter said in part:

"We once again call on you to review staff and finance

allocation for the commission so that safety-monitoring equipment can be maintained at the highest standard or replaced with new equipment.

"We assure you that we accept that safety standards are not compromised at present, but the apparent breakdown in monitoring equipment does affect the staff confidence that their work areas are efficiently monitored."

On March 21 this year the union again wrote to Mr Newman advising that its members would consider not re-starting the reactor unless full manning of five people a shift was restored.

"As you may be aware, the reactor is reaching the final phase of its normal lifetime and in our opinion requires the utmost surveillance, especially as more and more international authorities are tightening up the safety precautions in nuclear reactors," the letter said.

Mr Meyer said that soon after this letter the reactor team was increased to five a shift.

He said the reactor, which is used for research, was installed in 1958. The normal life of a reactor was 15 years.

A spokesman for the Atomic Energy Commission said last night that it would not compromise on safety in any way, and was in the process of recruiting senior staff in safety-related areas.

## AUSTRALIA

### OPPOSITION LEADER: SCRAP ATOMIC ENERGY COMMISSION

Melbourne THE AGE 16 December 1977 p 1

(From Nigel Williams)

(Tues) CANBERRA — The federal Opposition Leader, Mr. Hayden, has recommended scrapping the Australian Atomic Energy Commission.

In a personal submission to the commission review committee, he says the activities of the commission should be handled by three separate organisations. This would remove inherent conflict of interest between research and development.

Mr. Hayden attacks the commission's record, particularly its secrecy, and the amount of money spent on nuclear energy research in Australia compared with other forms of energy.

The Opposition Leader submitted:

- That an independent regulatory authority be established to be responsible for nuclear-related environmental protection, health, safety, security, safeguards and other non-proliferation activities.

- A new Government corporation be established to take over the present commercial activities of the commission, such as the production and marketing of radio-isotopes.

- That a national science authority be set up to handle the other functions of the commission.

Mr. Hayden stressed the submission was a personal view, even though it "reflects the general thinking about these matters within the ALP".

It had been prepared after close consultation with the Opposition spokesman on minerals and energy, Mr. Keating.

This is a clear attempt to counter criticism that Mr. Hayden and Mr. Keating are often running counter to each on their views on energy resource usage.

The submission spends much time examining the proportion of Australia's energy research funds which goes to nuclear fuel.

He suggests the commission's nuclear research spending is roughly half the Commonwealth's total energy research performance and about 35 per cent of the national energy research budget.

"These figures illustrate a quite inappropriate bias in Australia's energy effort.

"By comparison, work on coal, a larger and more immediately useful resource, was funded to the extent of \$4.25 million, petroleum research and development consumed only \$2.052 million — although it is a vital economic resource — and solar energy, in which Australia might make substantial innovations and discoveries, took only \$3.082 million," he says.

"Given that secrecy in the past has been disastrous for Australia's nuclear effort, there is no reason to be satisfied with the current attitude of the AAEC and the Government."

## AUSTRALIA

### ANALYST DUBS URANIUM ENRICHMENT PLANT OF DOUBTFUL BENEFIT

Melbourne THE AGE in English 4 Apr 79 p 11

[Article by Ed Kaptein: "Anthony's Uranium Plan Is a Bit Rich for Australia"]

[Text] [THE AGE editor's note] By Mr. Ed Kaptein, a PhD student at La Trobe University working on a thesis 'Energy Options for Australia' and holder of a La Trobe University research Scholarship. He has had 16 years' industrial experience, of which 10 years was in the oil industry. He is a member of the Movement Against Uranium. [End THE AGE editor's note]

**T**HE Harnsburg nuclear power plant accident is not likely to deter the Deputy Prime Minister, Mr. Anthony, from undertaking his feasibility study into the establishment of a uranium enrichment plant in Australia.

Mr. Anthony, like his predecessor, Mr. Connor, is championing the cause of uranium enrichment. The study will take five separate teams to West Germany, France, Britain, the United States and Japan. The results are to go to a "tripartite body", consisting of the Federal Government, State Governments and industry. The report is due by June.

An enrichment plant would fit in well with the Fraser Government's strategy of a mineral-export-led recovery.

Enrichment of uranium before export would add from 60 to 100 per cent to the value of the uranium ore. But the enrichment industry is highly complex and the feasibility study will have to go beyond simple percentages.

During most of the post-World War II period the US has enjoyed a near monopoly on the supply of enrichment services to commercial Western nuclear reactors.

After the oil crisis of 1973 there was a scramble to book capacity with US enrichers.

Subsequent downgrading of nuclear power plans in most industrialised Western countries has resulted in the accumulation of large stocks of enriched uranium around the world.

In this oversupplied market the Europeans are starting up their own enrichment capacity, mainly because they want to become independent of the US enrichment industry.

A large plant of the French-led EURODIF consortium will, when completed, be able to fuel about 85 large nuclear reactors.

This is more than the total West European nuclear capacity planned for 1983.

The second European entrant to the enrichment industry, the British-Dutch-German URENCO consortium, is moving more cautiously, but it has started construction of a first full-size plant at Capenhurst, in Britain.

URENCO claims two important advantages for its centrifuge enrichment technology over the diffusion technology of its main competitors: lower energy use and smaller plant size. A URENCO centrifuge plant can be built in small, self-contained stages, with successive expansions of the plant as the market warrants it.

What are the prospects for sales of enrichment services by Australia?

Australia's largest potential markets for uranium are Europe and Japan; the US has large domestic uranium reserves. But the Europeans will almost certainly want to take their uranium from Australia in a non-enriched form.

For similar — strategic — reasons, the Japanese no doubt will prefer to supply their own enrichment services, rather than rely on Australia.

Japan is, indeed, developing its own centrifuge enrichment technology, but does not seem to be as far advanced as URENCO. This creates a possibility for URENCO to sell its technology to Japan.

URENCO's chairman, Mr. Jelenek-Fink, has suggested that he would like to see the Japanese in on a tripartite URENCO-Australian-Japanese enrichment scheme, with an enrichment plant in Australia.

There are indications that the minds of planners in industry and government are turning towards a package deal combining sales of uranium with provision of enrichment services. One form such a package deal may take is the following:

- URENCO partners (West Germany, Britain and Holland) agree to buy Australia uranium in exchange for URENCO's supplying the technology for an Australian enrichment plant;
- Japan agrees to buy Australian uranium and has it enriched in an Australian enrichment plant.

Is it in Australia's interest to participate in such a scheme — or one of the many possible alternatives to it — assuming that the Japanese can be persuaded to join (which is by no means certain)?

The main point to make about an Australian enrichment plant is that it will be a high-cost enterprise. This is because the cost of transfer of enrichment technology, such as training and licensing cost, will be high.

Overseas enrichment industries are predominantly State-owned and State-subsidised enterprises. To compete successfully in the international market for enrichment services, it is more than likely that the Australian Government would, in turn, have to give substantial financial support to a domestic enrichment industry. Hence an Australian enrichment plant may well become a burden to the taxpayer.

Foreign exchange earnings and increased employment opportunities are the benefits most often cited for an Australian enrichment plant. To what extent are these benefits likely to materialise?

Enrichment of uranium is a highly capital-intensive industry. A figure of \$1000 million has been mentioned for a URENCO plant with an input of about 1800 tonnes of yellow cake. Overseas capital would be required to help finance such a plant. The servicing of foreign capital in the form of interest payments or transmission of profits, together with licence fees payable overseas, is likely to absorb a good deal of the extra export revenue earned from enrichment.

Australia's enrichment plant would add to world over-capacity. This could lower the price of enrichment services.

An enrichment plant is highly automated. The plant, when finished, would employ no more than a few hundred people. But even in the construction stage the contribution to employment would be limited, as almost certainly most of the centrifuges, which make up 60 per cent of the cost of a URENCO-type plant, would be imported.

The economic benefits of an Australian enrichment industry are very dubious. There is no compelling need to engage in such a high-risk and capital-intensive industry.

There is no doubt that the accident at the Three Mile Island plant in Pennsylvania is a serious setback for the plans for uranium enrichment in Australia.

But the greatest immediate impact of the accident is likely to be in the US. This is the least important potential market for Australian enrichment services.

Countries with a more centralised organisation of nuclear power production, such as Britain and France, are already arguing that their reactors are more tightly controlled and therefore safer than US reactors.

Apart from reducing the prospects for the nuclear industry generally, the Three Mile Island accident may well strengthen the hand of European nuclear technology at the expense of US technology.

# FOREIGN INVESTMENT GUIDELINES FOR URANIUM PROJECTS STUDIED

FROM THE WEST AUSTRALIAN in English 20 Apr 79 p 3

[Text] Canberra: The Federal Government is considering modifying its foreign investment guidelines for Australian uranium projects to enable WA's \$320 million Yeelirrie venture to get off the ground.

The Federal Cabinet this week asked departmental officials to draw up a report giving reasons why the guidelines should be changed for the Yeelirrie project.

Present policy requires a minimum 75 per cent Australian ownership and Australian control of new uranium projects, and it is more rigid than guidelines for other resources projects.

Under the planned financing arrangements for the Yeelirrie venture, the Western Mining Corporation will hold 75 per cent of the project, Esso Exploration and Production Australia Inc 15 per cent and Urengesellschaft Australia Pty Ltd 10 per cent.

## Anxiety

It is understood that anxiety has been expressed that the split-up of Yeelirrie production between the participating companies could breach the existing uranium guidelines.

Under a complicated arrangement revealed last year, Esso will have a 50 per cent share of the production in the project's second stage, WMC a 40 per cent share and Urengesellschaft 10 per cent share.

Federal informants said

last night that the Cabinet was considering the guidelines as they applied to the Yeelirrie project.

One official said: "They have come seriously under challenge."

The Opposition spokesman on economic affairs, Mr R. Willis (Vic), said that the Government's actions on the Yeelirrie project showed the farcical nature of its foreign investment policy and disregard for the dangers of a high level of foreign ownership of the Australian economy.

He said the arrangement meant that Esso would have 50 per cent of the output and it stood to make big windfall profits if the world price of uranium increased.

Mr Willis said that the accident at the Three Mile Island nuclear power plant in the United States had shown the dangers involved in the nuclear industry.

If the Government was determined to disregard such dangers and the increasing world anxiety at the problem, it should now waive its foreign investment restriction for the Yeelirrie project.

If the proposal was approved it would add to the already high level of

foreign control of Australia's mining industry. Foreign concerns accounted for 60 per cent of total mining production in 1976-77.

It would also set a dangerous precedent for other projects.

## AUSTRALIA

### UNDERGROUND URANIUM MINE PROPOSED FOR JABILUKA

Sydney THE SYDNEY MORNING HERALD in English 10 Apr 79 p 10

[Text]

Bowing to some of the environmental objections to the mining of its Jabiluka uranium deposit, Pancontinental Mining Ltd has proposed an underground rather than open-cut mine.

Companies which run the other Australian uranium deposits plan open-cut mines but underground mining is used at more than half of the working deposits in Canada and the United States.

Pancontinental's chairman, Mr A J Grey, said last night that the company was considering an underground mine. "If it is something which will stand the test of time it will eliminate the open-cut proposal."

He said an underground mine at Jabiluka would not be more costly than the open-cut because there would be no waste material to shift. The cost of a shaft and higher operating costs in working underground would be offset by not having to move waste and clearing, select and store it.

Pancontinental has the highest ranked uranium deposits of all deposits with 14.91 Ranger is 11, Ngarahak is 2.1 and Koonap is 1.51. With an underground mine, Mr Grey said, there would be virtually no waste.

He believed it would have more appeal to the Aboriginal

community. Pancontinental is still discussing mining its deposit (the biggest in Australia with over 50 per cent of total known reserves) with the Northern Land Council and the Government. The final environmental impact statement will be released "soon."

The proposal to mine underground was revealed at an Arbitration Commission hearing in Sydney relating to coverage for uranium workers.

The company stated that: "The alternative of underground mining is both feasible and attractive and hence needs to be set out in full, concurrent with the originally proposed open-pit mining concept in the final environmental impact statement."

The company claimed the environmental benefits of underground mining were:

- A major decrease in the physical disturbance of the land.
- Elimination of schist and sandstone waste dumps.
- Project facilities could be sited well away from the significant Aboriginal sites.
- The tailings dam could be significantly reduced in size because about 50 per cent of tailings could be returned as cement fill to the mine.
- Simplification of water management to the extent that no releases need be made to nearby Magela Creek.
- Reduction in noise, dust and radon gas emission.



WEST AUSTRALIAN NUCLEAR POWER, MINING PLANS DEBATED

THE WEST AUSTRALIAN In English 13 Apr 79 p 27

[1981]

A State Labor frontbencher has claimed that it is better and cheaper to put workers into a manufacturing industry rather than a nuclear industry.

The Opposition Whip, Mr R. F. Cloughton, told the Legislative Council that it cost \$20,000 to place a worker in a manufacturing industry.

It cost \$500,000 to place a worker in a nuclear industry.

He said that WA's entry into uranium mining could be unwarranted.

There was no need to take on waste disposal and there was no need to go to nuclear power generation.

Mr Cloughton was supporting an amendment during the address in reply on the nuclear industry.

The motion, introduced by Miss L. D. Elliott (Lab., North East Metropolitan), called on the House to oppose the WA development of nuclear power, mining of uranium and the disposal of radioactive waste.

Miss Elliott said that the people who cared about life and had been protesting for years about nuclear dangers had been "denigrated and ridiculed by the Charles Courts and Lang Hancock of this world."

They had been told their fears were nonsense, but the Harri-

burg accident in the United States had made people who had been smug and critical of the protests look silly, she said.

Despite all the factors against nuclear power the Premier kept saying the Government was determined to press on with uranium mining and a power plant for WA, Miss Elliott said.

#### 'GREEDY'

In reply, the Leader of the House, Mr MacKinnon said that the motion represented an attitude of greed and selfishness.

It gave little or no thought to the countries battling with power problems.

The amendment was trying to stop WA exporting uranium to give people power.

Mr MacKinnon rejected the suggestion that nuclear power stations were "ticking time bombs."

There was more loss of life from burst pipes in a conventional power station than in Harrisburg, where 51 lives were lost.

The debate was adjourned.

## PM's stand criticised

The Prime Minister, Mr Fraser, has been criticised for supporting the WA Government's plan to develop a nuclear power station.

Mr T. H. Jones (Lab. Collie) said that Mr Fraser had been badly advised about WA's available energy resources.

Mr Fraser had said that WA was not as fortunate as other States with enough coal reserves for power generation.

But WA had proven extractable coal reserves to meet power-generation needs for at least 50 years, Mr Jones said.

There were prospects of more reserves which would probably meet needs for many years after that.

Mr Jones, the ALP's spokesman on fuel and energy, said that there was no need to gamble with people's safety and waste huge amounts of money by building a nuclear power station.

SEVERAL UNIONS SAY WORK ON URANIUM MINING PROJECTS

Sydney THE SYDNEY MORNING HERALD in English 30 Apr 79 p 2

[Report from Richard Kerkely]

[U.S.]

Several key unions in the uranium mining industry have decided that they will not supply labour to the Ranger and Nabarlek uranium projects.

They have decided also to try to stop mining equipment getting to the sites.

The decisions were revealed yesterday by the senior vice-president of the ACTU, Mr Cliff Dolan.

The unions hoped their action would prevent mining at the two sites, he said.

The unions, the Amalgamated Metal Workers and Shipwrights' Union, the Australian Railways Union and the Electrical Trades Union agreed to the action at a meeting this month.

The partners in the Ranger project — Peko-Wallsend Ltd, EZ Industries Ltd and the Australian Atomic Energy Commission — and Queensland Mines Ltd, which own the rich Nabarlek deposits, have gained all the necessary approvals to begin mining.

With the wet season in the Northern Territory at an end, both groups are believed to have stepped up work on the mine sites.

Mr Dolan said the unions were simply carrying out ACTU policy in trying to stop the mining.

Some unions are defying the ACTU and support the mining of uranium. They include the Australian Workers' Union and the Miscellaneous Workers' Union which are now competing to cover uranium mine workers.

However, members of the unions opposed to mining are

needed for the construction of plant and other facilities at the sites.

The Ranger group had indicated it would require up to 500 tradesmen during the peak construction period, Mr Dolan said. These were mainly boilermakers and fitters, but also included about 50 electricians.

Besides the labour boycotts, the unions would try to stop the manufacture of mine equipment and the transport of equipment to the mines. The Transport Workers' Union would support this action.

However, Mr Dolan conceded that the transport ban might be difficult to implement effectively because the uranium companies could use owner-drivers.

He said similar action would be taken against other mining companies when they tried to begin operations.

# UTILITY TOLD UTILIZATION OF NUCLEAR POWER NECESSARY

Victorian Electricity Official

Source: THE AUSTRALIAN (Sydney), 1 May 1974, p. 11

**MELBOURNE:** Australia's uranium had to be used because nuclear power would supply about 31 per cent of world energy needs by the year 2020, the chairman of the Victorian Electricity Commission, Mr Charles Trethowan, said yesterday.

The VEC had no plans to build nuclear-power stations.

They were not needed now because nuclear power did not yet compare in cost with coal or hydro electric power.

In a statement, he said: "Our uranium oxide—21 per cent of the non-communist world's estimated reserves—can no longer be ignored.

"There is no question that our uranium must be used.

"By 2020, 31.4 per cent of the world's energy will come from uranium.

"There are already more than 230 nuclear-power stations operating safely, mainly in the United States and Europe, and there will be more as traditional fossil fuels are depleted."

Mr Trethowan said he believed that Australia's energy future depended on coal as a source of oil and electricity.

Electricity would supply 40 per cent of Victoria's energy needs by the year 2000.

International studies had shown that the world's energy demands

would more than treble in the next 40 years and international trade in fuels could increase ten-fold.

Mr Trethowan described the accident at the Three Mile Island nuclear power plant in Harrisburg, Pennsylvania, last month as "an incident—no more."

He said: "That view might at first seem callous, but it is an attempt to maintain the scientific detachment that is essential if we are finally to master uranium as we have already mastered steam and electricity.

"We will master it and we will be closer to mastering it when it is known what went wrong at Harrisburg."

## CONFERENCE

Mr Trethowan's comments came in a statement dealing with studies by the World Energy Conference on world energy needs for the next 40 years. He heads the Australian delegation.

He warned that solar-produced electricity and some other "quite exotic" proposals, such as wind or wave generated

### Queensland Premier

Reference: THE COURIER-MAIL in English 2 May 79 p 2

[Excerpt] The Premier (Mr. Blinke-Petersen) yesterday advised Queenslanders to stop worrying about nuclear power and uranium mining.

"It has been around for 30 years and there hasn't been a catastrophe yet," he said.

"We look like babes in the woods when we argue about uranium mining."

He said there were 208 nuclear power stations operating in the world, with 15 more being built or on the drawing-board.

Ten per cent of Europe's power was supplied by nuclear power, with the figure 25 per cent in Belgium and Sweden.

Mr. Blinke-Petersen spoke at the opening of the Electrical Industries Trade Fair, at the Cloudland Ballroom, Bowen Hills.

### Oil Company Official

Reference: THE AGE in English 3 May 79 p 22

[Excerpt]

The public view of nuclear development has to be a balanced one if energy shortfalls are to be avoided, a top world oil industry official said last night.

A managing director of the Royal Dutch Shell Group of companies, Mr. A. P. J. Benard, said this was all the more important in the aftermath of the Harrisburg incident.

He was speaking at the annual meeting of the Australian Institute of Petroleum in Melbourne.

"Environmental issues must be approached in a rational way."

"If the public perception of the dangers of nuclear development is not fairly counter-balanced by a clear notion of the risk to national security without it, this can lead to an energy shortfall now and hinder the development effort needed to minimise risks in the future," he said.

### Competition

Today's requirement for a balance of energy supplies, not simply more oil, created the paradox that the oil industry was inviting competition from other sources of energy.

"We can only hope for long-term solutions if we widen our horizons to embrace the availability of energy as a whole."

"Oil companies have both the means — financial, human and technical — and the motivation that the task requires. They must be an essential contributor to the total supply."

This called for the development of all energy resources — coal, nuclear (including fusion), solar, tar sands, as well as new oil provinces such as Mexico, the North Sea and Alaska.

"Oil supply is now too evenly matched to demand to be able to respond immediately to delays (such as those occurring in the development of other energy forms) and to the host of unforeseen political, economic and social pressures to which it is now subject," Mr. Benard said.

END 1100

## AUSTRALIA

### BRIEFS

**QUEENSLAND PLANS**--Queensland's State Electricity Commission had considered a site near Brisbane for a nuclear power station, Mr Ken Vaughan (A.L.P., Nudgee) claimed yesterday. The site, at Toorbul, on the mainland near Bribie Island north of Brisbane, had been discussed last year during the dispute over where to site the State's next power station. The State Minister for Energy, Mr Camm, said Mr Vaughan's claim was nonsense. The Government had no intention of looking for any other fuel energy source than coal in the foreseeable future. The minister's comments conflict with a statement last week by the Premier, Mr Bjelke-Petersen. He said: "I regret very much that we, as a country, are so far behind in developing nuclear power and energy . . . here in Australia certain sections of the community, like babes in the wood, are still arguing about whether we should mine our uranium and use nuclear power." Mr Vaughan said yesterday it was ridiculous to be talking about nuclear power stations. The State had 9000 million tonnes of steaming coal reserves. [Text] [Canberra THE AUSTRALIA in English 4 Apr 79 p 4]

**ANTINUCLEAR PROTESTS**--Canberra: Anti-uranium protests will be held in many parts of Australia this week as a result of the Harrisburg nuclear reactor accident. Mr T. Uren (Lab, NSW) said yesterday that more than 20,000 people in Sydney and nearly 20,000 in Melbourne were expected to protest tomorrow. Protests will be held in Geelong, Ballarat and Gippsland. The first protest will be in Alice Springs today and there will be rallies in Darwin tomorrow, in Brisbane and Toowoomba on Saturday and in Adelaide on Sunday. The protests are being supported by politicians, individuals, and organisations opposing uranium mining. Mr. Uren told a press conference in Canberra yesterday that ALP State branches would play a big role. [Excerpts] [Perth THE WEST AUSTRALIAN in English 5 Apr 79 p 10]

**PROPOSED REACTOR SITE**--The State Opposition has called on the Minerals and Energy Minister, Mr. Balfour, to spell out the Government's policy on nuclear power. The Opposition spokesman on energy, Mr. Amos, said yesterday a senior SEC official had named Portland [Victoria] as a viable site for a nuclear power plant. He said the assistant general manager of the SEC, Mr. Johnson, had publicly stated that Portland was a viable site for a reactor because transportation costs would be low. Mr. Amos said Democrat voters opposed to nuclear power should take note of Mr. Johnson's comments. [Text] [Melbourne THE AGE in English 28 Apr 79 p 11]

AUSTRALIA NUCLEAR LAB--Sydney, June 6--Security has been tightened at Australia's sole nuclear research laboratory near Sydney following reports that Japanese activists arrived to help train Australian anti-nuclear campaigners, it was learned here Wednesday. An opposition Labor Party member, who spoke in the House of Representatives Tuesday night, produced what he called an internal document circulated among the staff of the Lucas Heights laboratory, which said the presence of the Japanese activists could be a major menace to security. He demanded Minister for National Development Kevin Newman to confirm whether the information was true. Newman told Parliament Wednesday that he had been informed of the document and that an investigation was under way. The Japanese Embassy in Canberra said Wednesday it had no knowledge of the Japanese activists. The Lucas Heights laboratory, run by the Australian Atomic Energy Commission, has two experimental nuclear reactors and a uranium oxide storage facility. [Text] [Tokyo KYODO in English 0327 GMT 6 Jun 79 OW]

PLUTONIUM REMOVAL COST--Canberra, Thurs: The removal of half a kilo of radioactive plutonium from Maralinga in South Australia to Britain was estimated to have cost the Australian taxpayer \$175,000, a Senate estimates committee was told yesterday. The Australian Government late last year officially asked Britain to remove the plutonium, which was buried in the former nuclear test site for about 24 years. The plutonium was removed in a secret operation earlier this year and transported by unknown means. Senate estimates committee "F", inquiring into additional estimates of the Department of National Development, was told by a departmental officer yesterday that the \$175,000 estimate had been reached. He explained that Australia had agreed to pay the cost of the operation and transportation of the waste within the Australian continent, but no accounts had yet been received from the military authorities involved. [Text] [Perth THE WEST AUSTRALIAN in English 4 May 79 p 11]

WEST AUSTRALIAN NUCLEAR PLANT--Perth.--The Prime Minister (Mr. Fraser) yesterday indicated Federal Government support for a nuclear power station in Western Australia. He said he could understand the need to develop nuclear power in the State. Speaking to high school students in Bunbury, Mr. Fraser said the Federal Government did not have any plans for the development of nuclear power at present, but it was well aware of the programme which had been set down by the West Australian Government. [Text] [Brisbane THE COURIER-MAIL in English 25 Apr 79 p 2]

UNION FOR URANIUM--Sydney.--Australia eventually should become involved in uranium enrichment and the manufacture of nuclear fuel elements, a union has told the Federal Government's review committee on the Australian Atomic Energy Commission. The Association of Architects, Engineers, Surveyors and Draughtsmen said uranium was a prime candidate in the Federal Government's policy to upgrade Australia's mineral exports. The association's submission said an enrichment plant processing 12,000 tonnes of yellowcake a year would increase the value of the product from \$528 million to \$974 million at 1975 values. "The maximum outlay for such a plant would be \$1000 million, and it would give jobs to 1500 people," the association said. [Text] [Brisbane THE COURIER MAIL in English 26 Apr 79 p 11]

CSO: 5100



## SITE SELECTION FOR NEW NUCLEAR PLANT

Madras THE HINDU in English 18 May 79 p 11

[Text] Bombay, May 17. India's fifth nuclear power plant is taking "definite shape" with the beginning of governmental exercise to study its economic feasibility and to choose a suitable site for location.

The new nuclear power plant, which will be similar to Tarapur's twin units of 210 MW each with total power generation capacity of 420 MW, will be 89 per cent indigenous. Only strategic components that cannot be manufactured within the country would be acquired from abroad, according to authoritative sources here.

The site selection committee of the Department of Atomic Energy is now said to be busy choosing a suitable site for the plant. It will in short time put up its proposal to the Union Cabinet for approval.

The committee is understood to be favouring Gujarat for the location of the plant in view of the rapid industrialisation of the State and its growing demand for power.

While no final decision has been taken by the committee, the Maharashtra State Electricity Board (MSEB) is "upset" over the so-called provisional location of site in Gujarat. The Board is staking claims for the station on the strength of its argument that Bombay alone had more industries than Gujarat.

#### Norms for Location

But the committee is reported to be strongly in favour of locating the plant site which would be far from a coal field and areas of seismic activity. It should be located at a spot at least 700 km from a coal source.

On this factor alone, the committee seems to be disfavoured Maharashtra. West Bengal too has been ruled out as it feels that an atomic power station is not desirable in that State.

The Government is said to have made a provision of Rs. 80 to Rs. 90 crores in the Sixth Plan for the erection of the nuclear power plant.

It has not been decided yet whether it should be a boiling water system type reactor like the one in Tarapur without the facility of recycling spent uranium fuel, or the more advanced fast breeder reactors existing in foreign countries.

The success of the 15 MW pilot Kalpakkam breeder reactor near Madras would decide the type of nuclear plant to be set up.

#### Ranapratap Sagar Plant Completed

Meanwhile, the second unit of the Ranapratap Sagar power plant in Rajasthan has been completed. It is ready for all operations preparatory to taking in heavy water for the final stages of commissioning.

Design changes and system modifications are being carried out before heavy water becomes available. Ranapratap Sagar is 400 MW station with twin units of 200 MW each. The first unit is generating only 160 MW.

Work on the 470 MW unit at Kalpakkam has been hit due to the non-arrival of enriched uranium from France. Kalpakkam plant is also a twin unit project.

About 40 per cent of work on the first unit of the Narora plant has been completed. Construction of the perimeter walls of reactor buildings one and two are on.--PTI.

CSO: 5100



## FAST BREEDER TEST REACTOR AT KALPAKKAM

Calcutta THE SUNDAY STATESMAN in English 13 May 79 p 8

[Text] The fast breeder test reactor (FBTR) project at Kalpakkam, near Madras, is said to be facing difficulties in obtaining highly enriched uranium, needed as part of the fuel. The material was to be supplied by France; but, apparently, the French are now demanding a higher price and insisting on more stringent controls than originally agreed upon. The problem may seem similar to the one at Tarapur; but the two projects are quite different in purpose and technical requirements.

Enriched uranium for a reactor of the Tarapur type has a uranium-235 content of about three per cent (as against the natural proportion of less than one per cent), while enriched uranium for a fast breeder reactor must have a U-235 content of about 85 per cent. (Enrichment above 90 per cent would make the material suitable for an explosive device.) It might be useful first to consider why so highly enriched fuel is needed for a fast breeder, and what such a reactor is expected to yield.

Uranium-235 is the only fissionable or fissile part of natural uranium; in fact, the only fissile material in nature. But two other fissile substances can be produced; uranium-238, constituting more than 99 per cent of natural uranium, can be converted into plutonium-239, and thorium-232 can be transformed into uranium-233. Plutonium-239 and uranium-233 are also fissile.

If nuclear (fission) energy were to be obtained only from uranium-235, the available fuel would soon be depleted; the compulsion to produce or "breed" more fissile material. Some plutonium is produced in normal reactor operation, and can be extracted from spent fuel. But an ordinary or "thermal" reactor "burns" more fuel than it breeds; a breeder reactor is intended to yield more fuel than it will consume. The main technical difference between the two types is that, while a thermal reactor uses a moderator (like water or graphite to slow down the neutrons which split fissile nuclei, no moderator is used in a breeder reactor which depends on the action of "fast" neutrons.

By slowing down the neutrons, a moderator facilitates their encounter with fissile atoms in a fuel in which most of the atoms are non-fissile. In a

fast breeder, the fuel is entirely, or almost entirely, fissile, so that the neutrons do not have to be moderated. But many of the neutrons, which are released in fission, escape the fuel core; when they hit a blanket of non-fissile, but fertile, material like uranium-238 or thorium-232 more fissile material is produced in the form of plutonium or uranium-233.

The technological requirements are highly exacting, largely because fast reactors--with fuel cores which are almost entirely fissile--have much higher power densities than thermal reactors. This, in turn, creates a formidable problem of efficient heat transfer, the most favoured coolant at the moment being liquid sodium. There are also problems of fuel and structural damage, because of high fluxes and high neutron energies. Considerable progress has been made at Kalpakkam in mastering techniques to cope with these problems. But an unexpected difficulty seems to have arisen over the fuel itself.

Indian interest in fast breeder technology is easily explained. The country's uranium reserves are not very large, but there are vast deposits of thorium. It was, therefore, planned to make a start with experimental breeders by using the plutonium recovered from the spent fuel of thermal reactors, and then to fuel fast reactors with uranium-233--to produce more uranium-233 from thorium. The test reactor at Kalpakkam was designed, though with some modifications, on the model of the French Rapsodie-Fortissimo reactor. French cooperation was to include supply of a part of the fuel, which was to consist of both plutonium and highly enriched uranium. Since India has no enrichment facility, the enriched uranium was to be obtained from France.

The original design provided for a fuel core of just over 180 kg, composed of enriched uranium oxide and plutonium oxide. Uranium oxide was to account for more than 126 kg, the uranium being enriched to a U-235 content of some 85 per cent. French insistence on stricter controls may be prompted by the consideration that this is almost weapon-grade material. But, then, so is plutonium, which India can extract from spent reactor fuel; there are adequate fuel reprocessing facilities.

A further problem is said to have arisen over the price--the French suppliers asking for much more than originally indicated. Because of these uncertainties, efforts are being made at Kalpakkam to develop "an alternative indigenous fuel"; presumably, the alternative is to dispense with enriched uranium and use plutonium for the entire fuel core. But, apart from possible design changes, it may take time to produce enough plutonium for the purpose.

The latest report of the Department of Atomic Energy stated that the FBTR was expected to become "critical", or start operating, towards the end of May 1981. It may now be delayed. Some delay, however, will not make much difference; even the official projection is that fast breeder technology can be expected to become "commercially exploitable" only during the second half of the 1980's.

## BRIEFS

URANIUM SUBSTITUTE—New Delhi, 17 May. Indian scientists are certain to develop a substitute fuel for enriched uranium within 3 years, according to Dr Homin Sethna, chairman of the Atomic Energy Commission. Dr Sethna told the magazine INDIA TODAY, that the fuel being developed was an oxide fuel and that the Tarapur atomic power plant could be run on a mixed oxide fuel. The Tarapur plant, built by the United States, is finding it difficult to obtain a steady flow of enriched uranium fuel because of the new U.S. action full-scope international safeguards. Prime Minister Morarji Desai said recently that India would find a way out of the recurring uncertainty faced in getting enriched uranium from the United States. Although President Carter recently approved a shipment of 19 tons of fuel to India, Dr Sethna said it was doubtful if the U.S. Nuclear Regulator Commission (NRC) would allow this consignment to be sent. The U.S. regulations are extremely unfair. The Carter administration is trying to get our fuel needs passed but some lobbies are working against us, Dr Sethna said. [Text] [Peshawar KHYBER MAIL in English 18 May 79 p 1]

INCREASE IN URANIUM ORE OUTPUT--Patna, May 13.--The production of uranium ore will be stepped up shortly following the development of four new horizons in the Jadugoda Uranium Mines in Singhbhum district, reports UNI. The second stage shaft sinking project at the mines was completed in 1977-78. Official sources said that the ore-pass in stage two had been extended from the first stage depth of 280 metres to 605 metres. The opening of the four new levels became possible with the deepening of the shaft. Cross cuts from the shaft to the uranium ore-body had been completed in two deeper levels and ore development has since been in progress, the sources said. [Text] [Calcutta THE STATESMAN in English 14 May 79 p 13]

RADIATION COMPLAINTS--New Delhi, 26 May (AFP)--Employees of the U.S.-built atomic power plant in Tarapore near Bombay, have complained about the high level of radiation inside the plant, according to reports reaching here today. The reports quoted S. M. Puttur, secretary of the All-India Atomic Energy Employees Coordination Committee, as saying that the radiation level "is so high that employees consider it a death trap." Mr. Puttur added that the "Department of Atomic Energy (DAE), which is a law unto itself, is flouting all canons of radiation protection by calling employees from the navy, state electricity boards, fertiliser corporation, etc., for maintenance of the plant." He said his committee agreed with views expressed at the parliamentary consultative committee that "a review of the performance of the department is long overdue." [Text] [Hong Kong AFP in English 0742 GMT 26 May 79 BF]

CSO: 5/00

## INDONESIA

### BRIEFS

PROPOSED 1982 NUCLEAR POWERPLANT--The National Atomic Energy Agency is making preparations for the construction of a \$1-billion nuclear power generating plant with an estimated capacity of 600 megawatts. Professor Habibie, the agency's director general, said in Jakarta today that the project, with construction to begin in 1982, is intended to meet the needs of public consumption in Indonesia. The secretary general of the agency [name indistinct] said that the construction of the nuclear powerplant will cost less than that of a solar or coal powerplant. A suitability study on these projects, which will be started late next year, can prove this, he added. He said that preparations to build the nuclear power station are now under way. [Text] [Jakarta Domestic Service in Indonesian 1200 GMT 30 May 79 BK]

CSO: 5100

JAPAN

DOCUMENT CITING U.S. NUCLEAR ACCIDENT BARRED BY COURT

Tokyo KYODO in English 0059 GMT 25 May 79 OW

[Text] Takamatsu, Ehime Pref, 25 May (KYODO)--Plaintiffs in an anti-nuclear suit Friday submitted a document citing the near disaster at the Three Mile Island nuclear power plant in the United States last March to a hearing to the appellate court. The document claimed the U.S. nuclear accident proved that the state's insistency on the safety of nuclear power stations was unreasonable, and that the lower court's ruling was based on wrong judgment.

The plaintiffs, 32 residents near Shikoku Electric Power Co.'s first nuclear reactor in Ikata Town, have been continuing their battle in the Takamatsu High Court after their appeal to have the central government rescind its permission for the construction of a 566,000-kilowatt nuclear generator was rejected by the Matsuyama District Court in April last year.

In the 130-page report to the third hearing, the claimants emphasized that the Ikata reactor was of the same type as the one that caused the accident at the Pennsylvania plant. They said the U.S. accident proved that the emergency core cooling system claimed to be the last-resort safeguard failed to work effectively, eventually allowing a quarter of the core to melt down.

The accident contradicted the effectiveness of the emergency cooling apparatus and the safety of nuclear reactors as claimed by the state and the utility company, they said.

They also took note that hydrogen gas bubbles were generated in the reactor, the secondary cooling water flow stopped and the steam generator broken down in reality, the faults denied by the defendants and the lower court.

The defendants protested the addition of new documents by the plaintiffs and demanded that only the previously-submitted documents be taken into consideration. The court upheld the defendants' demand, arousing strong objection from the claimants. During the debate, a support of the plaintiffs was evicted from the court for creating disturbance.

CSO: 5100

## JAPAN

### NUCLEAR OFFICIAL OPPOSES IMPORTING CANDU REACTOR

Tokyo KYODO in English 1026 GMT 30 May 79 OW

[Text] Tokyo, May 30, KYODO—Hiromi Arisawa, Chairman of the Japan Atomic Industrial Forum, Inc., expressed Wednesday a negative attitude toward importing Canadian-developed heavy water reactors. He disclosed his view officially on the matter for the first time in addressing a meeting of the Industry Club of Japan. He said that sufficient grounds for the introduction of Candu reactors should be shown to convince people concerned. Observers understood his remark as indicating that he thinks it more desirable for Japan to develop a new domestically produced power reactor rather than import the Canadian model. Arisawa was said to have shown a negative attitude toward buying the next-generation power reactor model from Canada in a hearing conducted by the Atomic Energy Commission last April. But, until now he had not made any public comment on this matter.

The commission is now studying whether to introduce the Canadian natural uranium-fueled generator, as planned by the state-run Electric Power Development Co., and the International Trade and Industry Ministry. The commission, which is opposed to the import plan, is expected for political reasons to reach a final decision after the Tokyo summit of seven industrialized countries late next month. Nine power utility firms are also opposed to the Canadian reactor model for safety reasons, wanting rather to use the advanced thermal reactor which is being developed by the state-run Power Reactor and Nuclear Fuel Corporation.

CSO: 5100



## JAPAN

### DIET APPROVES CONSTRUCTION OF URANIUM REPROCESSING PLANTS

Tokyo KYODO in English 0953 GMT 1 Jun 79 OW

[Trans] Tokyo, June 1, KY (D)--The country's nine regional electric power companies today gained the freedom to build uranium fuel reprocessing plants as a result of Diet approval of a law revision concerning atomic reactors. The revision bill for Japan's law for regulation of atomic reactors was passed by the upper house Friday, following its approval earlier by the lower house.

The revision makes it possible for private interests to construct used uranium fuel reprocessing plants in Japan.

Previously, only the government, specifically the Power Reactor and Nuclear Fuel Development Corp., had been empowered by law to build such plants. The governmental corporation has built the first such plant in Japan in 1974 at the government's Tokai village nuclear energy testing center in Ibaraki Prefecture. The pioneer plant, however, is capable of reprocessing annually only about 310 tons of spent uranium fuel. Its operation has been heavily restricted under a special Tokyo-Washington agreement reached in September 1977 after tough negotiations that had delayed the start of its operation from July 1977 to October of that year.

Regarding Japan's rush to have its own spent uranium fuel reprocessing plants as possibly conflicting with its international nuclear nonproliferation policy, Washington has provisionally permitted the start of the plant's operation under the Japan-U.S. civil energy agreement. Whether the plant will be able to go into full operation still depends on the outcome of the series of conferences held under the U.S.-sponsored 40-nation International Nuclear Fuel Cycle Evaluation (INFCE) program. The conferences have been held since October 1977 on a two-year schedule. The Japanese electric power industry, which produces much more spent u-fuel annually than the plant can process, has been having spent fuel reprocessed in Britain, and more recently, in France as well.

Approval of the law revision has cleared the way for the power industry's long-pending plan to build a second fuel reprocessing plant in Japan, its own. It is to be capable of treating 1,500 tons of spent fuel a year--seven times the amount handled by the governmental plant. A meeting of sponsoring companies to realize the project, including nuclear engineering and chemical companies, is to be held this month. The new plant would cost from 400 billion yen to 500 billion yen to construct. Well aware of the delicate situation in which the governmental plant is still placed, the industry will keep its project attuned to INFCE conference developments.



## PAKISTAN

### 'KYODO' INTERVIEWS PAKISTANI AMBASSADOR ON TOKYO SUMMIT

Tokyo KYODO in English 0125 GMT 21 Jun 79 OW

[Excerpt] Tokyo June 21 KYODO--Paving ways for the safe utilization of nuclear energy for the benefit of both the developed and developing parts of the world must be a major subject of discussion at the economic summit of the seven Western industrial powers in Tokyo next week.

This was stressed by Pakistani ambassador to Japan Qamar ul-Islam during a recent interview with KYODO News Service at his office in Tokyo.

"We want safe nuclear energy ... we have no choice in the Third World, because enough attention has not been paid to develop alternative sources," Islam said.

He said that the current energy problems do not arise merely from the raising of prices by oil-producing countries.

The problem, the ambassador said, is the "total availability (of oil resource) over the period of the next 15, 20, 30, years."

"We are unfortunately concentrating on the present supplies and on present prices which create problems. Of course they do--but what will happen in 25 years or 30 years when there is no oil?" he said.

He said that the industrialized countries have talked about the development of alternative energy sources for oil such as solar, tidal, wind, liquefaction of coal and geothermal.

"But no effort has been made or little effort has been made to develop them," he said.

As all the natural non-renewable sources are destined to run out, "the nuclear energy is the only possible source left for the developing countries," Islam said.

The major question involved in the utilization of nuclear energy, he said, is "how to make it fool-proof against accident, greed, carelessness, bad design, and also, eventually, against misuse by converting it into weapons."

He said that this should be a key topic of discussion at the June 28-29 economic summit in Tokyo of Japan, the United States, France, Britain, West Germany, Canada and Italy.

Commenting on controls over nuclear energy development to check proliferation of nuclear weapons, the ambassador said, "The argument that it can be converted into weapons sounds very good on paper."

"But there are not enough madmen in a country who want to use them (nuclear weapons) after what happened in Japan (atomic bombing of Hiroshima and Nagasaki). And there can certainly be fool-proof safeguards," he said.

He said that there is already a 137-megawatt nuclear power plant in Pakistan, and "we need more--many more, because we have no oil to speak of."

(20) 5100

# N-TECHNOLOGY MUST FOR DEVELOPMENT

Quetta BALUCHISTAN TIMES in English 20 May 79 p 1

[Text] United Nations, 19 May. Pakistan came out strongly last night against any efforts aimed at preventing the developing countries from acquiring nuclear technology for peaceful purposes.

"It will be ironic if the noble cause of disarmament is given an interpretation and is pursued in a manner which deprives these countries of the benefits of advanced technology without which their economic backwardness will be perpetuated and their progress paralyzed, said Ambassador Niaz A. Naik.

Speaking in a debate on the components for a comprehensive program of disarmament in the Disarmament Commission, he said the approach to this problem should be global and not on a subjective or selective basis applying different standards to different states.

"The universal desire for genuine disarmament should not be allowed to prevent developing countries from acquiring modern technology, including nuclear technology for peaceful purposes" Ambassador Naik added.

Although he did not specifically mention any country, his remarks were obviously directed at the United States-led attempts against Pakistan's peaceful nuclear program.

"Pakistan's concern for non-proliferation and its awareness of the danger of a nuclear holocaust are second to no other state he declared." We have an immutable commitment to the goal of nuclear non-proliferation and believe that this involves obligations and responsibilities on the part both of nuclear-weapon states as well as non-nuclear-weapon states."

However, the Ambassador said like most of the developing countries, Pakistan was of the view that the cause of nuclear non-proliferation should be promoted on the basis of universality, non-discrimination and the sovereign equality of state.

CSO: 5100

## PAKISTAN

### MUFTI URGES ACQUIRING NUCLEAR TECHNOLOGY

Quetta BALUCHISTAN TIMES in English 6 Jun 79 p 1

[Text] Multan, June 5: Maulana Mufti Mahmud, President, Pakistan National Alliance, has urged the Pakistan Government to go ahead with its programme to acquire nuclear technology.

Addressing a reception hosted in his honour by Jamiat Ulema-i-Islam, Multan City, here today, he said as a citizen of Pakistan he wanted his country to acquire this technology.

Referring to opposition from some foreign powers especially America, he said if it was crime to become a nuclear power then why she herself had committed that crime. This crime had also been committed by Russia, Great Britain, India and some other countries.

Why these foreign powers were getting jittery and nervous about nuclear programme of Pakistan, they did not want the Muslim countries to get stronger, he added. [as printed]

He said he had explained to Arab heads of State and other important people during his last tour of Middle East countries the background and causes of American Government's anger against Pakistan on the issue and her decision to cut economic aid to Pakistan.

Talking of stop of American economic aid he said our people would prefer to starve rather than bartering away their freedom. To acquire nuclear technology would be a matter of pride for Pakistan, he observed. [as printed]

The other countries, he said should have no fears from Pakistan in this regard. We were Muslims and 'Momins'. We would never destroy peace, he assured.

The Muslim countries, he said, gave encouraging response to his appeal to make up for the loss of American aid to Pakistan.

About the affects of former Prime Minister late Mr. Z. A. Bhutto's case, he said it would not affect our relations with the Arab brethern countries. They had told him that their relations with Pakistan were based from country to country people to peoples and not on one individual.

He however expressed his dissatisfaction over the working of Pakistani embassies in Arab countries. These embassies, he said were manned by personnel employed by the previous government and had leaning towards them. The image of Pakistan, he said, was suffering on account of poor performance of embassies.--AP

END 5100

## PAKISTAN

### BRIEFS

ATOMIC SCIENTIST DISAPPEARS--The Netherlands Government says it has stepped up investigations into reports that Pakistan has received details of the process used in Holland for enriching uranium. This can be a big step by Pakistan toward possible production of an atomic bomb. The inquiry follows the disappearance of a Pakistani scientist who was working with the uranium enrichment consortium in which Britain and West Germany are also partners. However, the Pakistan ambassador to the Netherlands told the Dutch Foreign Ministry that his country has no intention of making its own nuclear bomb. [Text] [Delhi Domestic Service in English 0830 GMT 22 Jun 79 BK]

CSO: 5100

BRIEFS

MINERAL DEPOSITS IN TIBET--Lhasa, May 27 (XINHUA)--Salt lakes on the Tibetan Plateau contain rich deposits of sodium, potassium, boron, magnesium, lithium, rubidium, cesium, bromine and radioactive uranium and thorium. It was confirmed here by a Chinese scientific expedition after a long period of survey. The expedition also found three new boron deposits. The scientific expedition surveyed more than 50 salt lakes between 4,500 and 5,500 metres above sea level on the Tibetan Plateau over the past 3 years. The lakes are situated in northern Xizang and the Ali area of western Xizang. The scientific workers travelled 90,000 kilometres over a 13-month period to accumulate data for exploitation of natural resources on the plateau. The salt lake deposits are particularly rich in magnesium and lithium. There are outcroppings of some boron-magnesium deposits which are as thick as two metres. Most of the salt lakes belong to the Holocene Epoch (the latest 10,000 years). Such findings are helpful in the study of changes during the past 10,000 years in Xizang and prospects for salt resources. The present survey was one of the main programmes set by the Chinese Academy of Sciences for a comprehensive survey on the Qinghai-Xizang Plateau from 1973 to 1980. The expedition was dispatched by the Qinghai Salt Lake Institute of the Chinese Academy of Sciences. [Text] [Beijing XINHUA in English 0850 GMT 27 May 79 OW]

CSO: 5100

SOUTH KOREA

SHARE OF NUCLEAR POWER GENERATION TO BE INCREASED CONTINUOUSLY

Seoul MAHIL KYONGJE SINMUN in Korean 10 May 79 p 1

[Text] The government has decided to implement a long-term electric power resources development plan from 1979 to 1986 without modification. This was revealed by the Ministry of Energy and Resources May 10.

Under the plan, the share of nuclear power generation will be increased from 8.5 percent to 30.6 percent during the targeted period, whereas the ratio of oil-fueled thermal power generation will be decreased to 41.3 percent from 71.3 percent.

The ministry further disclosed that the construction of nuclear power generation plants would be pushed ahead as originally projected since it came to the conclusion that safety facilities would be adequately installed at the new nuclear power generating plants.

The ministry further said that there were some arguments about the construction of nuclear power generation plants following the unprecedented crisis involving the radiation leakage after the recent accident at the Three Mile Island nuclear plant in the United States.

The ministry plans to construct eight more nuclear power generating units of 900,000 kilowatt capacity by 1986. This will raise the ratio of nuclear power generation to 6,416,000 kilowatt, accounting for 30.6 percent of the total generating capacity of 20,936,000 kilowatt.

The Kori nuclear unit 1 is presently operational, nuclear units 2, 3 and 5 are under construction and the construction of nuclear plants 7 and 8 will begin within this year. The suppliers of nuclear power units 9 and 10 are expected to be selected through international bidding before the end of this year.

Meanwhile, the share of hydroelectric power generation will stand at 2,695,000 kilowatt or 12.9 percent and coal-fueled thermal power generation at 3,187,000 kilowatt or 15.5 percent in 1986.

With this, by 1991 the ministry plans to raise the ratio of nuclear power generation to 40 percent, oil-fueled thermal power generation to 30 percent and coal-fueled thermal power generation to 10 percent, respectively.



## BRIEFS

**KORI NUCLEAR POWER PLANT**--The nation's first nuclear power plant, the Kori Unit 1 in Kori, some 320 km south of Seoul, suspended operation on Thursday temporarily "due to oil leakage" in the main transformer at the transformer substation adjacent to the 587,000 kw power plant, it was learned yesterday. According to a spokesman for the Korea Electric Company (KECO), the leakage of oil from the transformer has nothing to do with any nuclear reactor or turbine generator in the nuclear power plant. He said the Kori Unit 1 would return to normal operation on 23 May when the repair work was scheduled to end. The nuclear power plant has generated only 440,000 kw daily due to a safety checkup since late March. There was a slight disorder in the cooling system of the second portion of the power generation equipment early last month, which brought about the power plant's complete suspension of power generation. [Text] [Seoul THE KOREA TIMES in English 19 May 79 p 7]

**KORI NUCLEAR WASTES**--Nuclear wastes from the No. 1 Kori Nuclear Power Plant reached some 1,000 drums, twice the amount expected since the beginning of operations in April 1978. The unexpected large amount of nuclear wastes is feared to cause serious pollution problems in the event nuclear plants are constructed in Korea. The 1,000 drums of waste are stored in a tank in the ground which can hold waste material from the plant for five years. The Ministry of Science and Technology is reported to have failed to set up detailed plans to dispose of the radioactive elements except for a vague plan to store the wastes in the tank for five years and then to dispose of it using a disposal method similar to that used in Western countries. But the methods of disposal under the ground or under the sea, which have been used in Western countries, are known to have some defects. It has been confirmed that the undersea disposal method is the cheapest way to dispose of nuclear wastes. However, there is a danger that the storage vessel may erode underwater, causing a radiation leak. [Text] [Seoul THE KOREA HERALD in English 31 May 79 p 8]

NUCLEAR POWERPLANT SHUTDOWN--Seoul, June 4 (HAPTONG)--Operation of Korea's first and only nuclear power plant in Kori near the southern port of Pusan was being suspended since last week following trouble in its low pressure turbine. This was the fourth trouble at the Kori atomic power plant since it developed a peakage of water in its water cooling system on March 26. The state-run Korea Electric Company, which operates the powerplant, said over the weekend operation of the plant would be resumed either tonight or Tuesday after a repair work. The latest trouble came only about a week after the plant had been subject to an overall technical inspection. [Text] [Seoul HAPTONG in English 0054 GMT 4 Jun 79 SK]

KORI NUCLEAR PLANT--The replacement of some parts of the equipment of Kori Unit 1, the nation's first nuclear power plant, is necessary, it was pointed out yesterday by some local experts in the field. The frequent (four times) shutdowns of the 595,000 kw power plant in Kori, some 320 km south of Seoul, in the past three months were due to the turnkey basis construction of the power plant, which had been unfaithful, according to them. They said the subcontractors for the second portion of the power plant, which had supply contracts with GEC of Britain, supplied defective tools and materials for the turbine generator part. Some other experts said the nuclear reactor type of Kori Unit 1 was too old-fashioned. Officials of the Korea Electric Company said they were planning to replace some parts of the power plant believed to be defective. [Text] [Seoul THE KOREA TIMES in English 5 Jun 79 p 7]

NUCLEAR POWER PLANT--Paris, 11 Jun (KYODO)--France is considering selling equipment for at least one nuclear power plant to South Korea, the French economic paper FORUM INTERNATIONAL said Monday. French Foreign Minister Jean Francois-Poncet is expected to sign an agreement to that effect on his visit to Seoul later this year, the paper said. South Korea plans, it went on, to build 40 nuclear power plants by the year 2000. Former South Korean Premier Kim Jong-pil is in Paris now and is expected to take up the nuclear power plant issue with French leaders. [Text] [Tokyo KYODO in English Time not Given 11 Jun 79 OW]

WOLSUNG NO 1 REACTOR--New York, 3 May, HAPDONG-KYODO--South Korea and Canada have signed an agreement for an additional 200-million-dollar loan which will finance the export of more Canadian equipment and services for a 600,000-kilowatt, Canadian-designed Candu nuclear-power plant, named "Wolsung No. 1 Reactor." Korean ambassador to Canada Young Ki Han Wednesday in Ottawa signed a 87-million-dollar Export Development Corporation (EDC) loan agreement with EDC President J. A. McDonald, and another agreement for 113-million-dollar loan provided by a consortium of Canadian banks led by the Royal Bank of Canada. The construction of Wolsung No. 1 Reactor which would eventually cost 1.124 billion dollars will be completed in April 1982. The plant is being built by Korea Electric Company. [Text] [Tokyo KYODO in English no time given 3 May 79 OW]

## BRIEFS

THIRD NUCLEAR POWERPLANT CONSTRUCTION--Taipei, June 5 (CNA)--Construction of the third nuclear powerplant is under way, an official of the Taiwan Power Co said Thursday. He said the plant in southern Taiwan will be installed with two generating units, each with an installed capacity of 950,000 kilowatts. The first unit is expected to start operation in 1984 and the second one the following year. Taipower is building three nuclear power plants, each plant equipped with two generators of the same capacity. The first plant has an installed capacity of 1,272,000 kilowatts and the second plant 1,970,000 kilowatts. The state-run power company plans to build more nuclear power plants because of depleting supply of oil. [Text] [Taipei CNA in English 0239 GMT 8 Jun 79 OW]

ESat: 5100/

## ARGENTINA

### BRIEFS

NUCLEAR TRAINING PROGRAM--Buenos Aires, May 26 (XINHUA)--A basic training course for university postgraduates to prepare them to work in nuclear power stations has recently been instituted in Argentina. The course will train specialists in engineering, physics, chemistry and administration. They will work in nuclear power stations now in operation or under construction. Thirty-five technicians from Argentina, Uruguay and Peru are taking the course. A training course for nuclear projects in Latin America was also instituted in Argentina last November to train specialized personnel needed in the various phases of construction of a nuclear power station. There are also two centres for training senior nuclear personnel. The trainees are from Argentina and other Latin American countries. [Text] [Beijing XINHUA in English 1517 GMT 26 May 79 OW]

NEW NUCLEAR PLANT IN NORTHWEST--Adm Carlos Castro Madero, chairman of the National Atomic Energy Commission (CNEA), has reported that a nuclear plant will be built in 1987 in the Argentine northwest region. He added, however, that the exact location of the plant has not yet been established. In a statement published yesterday by the Salta newspaper EL TRIBUNO, Castro Madero said that the nuclear plant "is programmed to start operating either in 1994 or 1995." He added that the CNEA is now studying what would be the best location for the plant from the technical point of view. During the interview he granted to the local newspaper, Castro Madero reasserted that "Argentina has not made any proposal to Switzerland to store its radioactive waste." A report from Europe stated that Argentina has proposed to Switzerland that it would store Swiss radioactive waste in exchange for the technology and installations needed for the production of heavy water. [Excerpts] [Buenos Aires CLARIN in Spanish 6 Jun 79 p 5 PY]

CSO: 5100

# URANIUM DEPOSIT, POWER PLANT OPERATIONS REVIEWED

Rio de Janeiro MANCHETE in Portuguese 2 Jun 79 pp 86, 88, 90

[Article by Arnaldo Cesar: "The Nuclear Power Race"]

[Text] When the Americans Bill Furquer and Nell Jonshon [sic; Johnson], geologists from the University of Illinois, were in the interior of Ceara in 1944, very few people noted their presence. Equipped with Gauge [sic; Geiger] counters, they criss-crossed the interior of Ceara for six months looking for uranium. If they found anything, nobody was informed. But one thing is certain and that is that two years later, B-25 aircraft hauled some minerals, collected in a place called Fazenda Itataia, in the township of Itatira, 220 kilometers from Fortaleza, to the United States. Last month, Minister of Mines and Energy Cesar Cals went there. He issued orders to inform the political leaders and residents of the region that he was bringing "important disclosures."

The information indeed was important. The Igreja Mountain Range, squeezed between the little towns of Santa Quitéria and Itatira, simply happens to be the biggest uranium deposit in the country. Engineers from NUCLEBRAS [Brazilian Nuclear Corporations] discovered that there are 122,000 tons of this mineral here. That is enough to guarantee the operation of 35 atomic reactors, of the type to be installed in the Angra II Power Plant, for 30 years. In other words, under the Igreja Mountain Range, mixed in with limestone and marble, we have a quantity of uranium estimated at \$125 billion, approximately 2.5 trillion cruzeiros. What is even more exciting is that so far only one third of the entire deposit has been prospected and that means that this fabulous figure could even be multiplied by three.

Peculiar over this bit of good news, the people of Santa Quitéria and Itatira had trouble believing what they heard. It was difficult for them to imagine that the Igreja Mountain Range could conceal such tremendous wealth. Until then, the area's claim to fame was confined to its providential 16 springs that were always ready to come to the aid of neighboring towns during the worst droughts as well as the mysterious stories told by old Joao Pedro who was accustomed to talking with God when he went up into the mountains to go hunting.

Apart from that, the region's routine existence never changed. But change began only in 1977. During that year, the first jeeps arrived, bringing officials from NUCLEBRAS. In less than a month, they built a camp and then they built a fence around it. The dusty little road linking the districts of Lago do Mato with Santa Quitéria had never seen that much traffic. Initial calculations established with absolute certainty the existence of 18,000 tons of uranium in this reserve; just 4 months later, the estimate went up to 74,500 tons and it finally reached 122,000 tons at this time, thus providing the reason for the minister's visit.

This is undoubtedly a tremendous source of wealth which is already yielding benefits even before it has been explored. It is no secret to anybody that the announcement of this discovery is being used as a trump card by the administration in the complicated and bitter debates triggered by the Brazilian nuclear accord. Supported by technical opinions supplied by John Albuquerque Firman, director of mineral resources at NUCLEBRAS, Cesar Cals has already admitted that "in the very near future, Brazil will be a big uranium exporter."

The results achieved by NUCLEBRAS over the past 2 years in the mineral prospecting and research sector seem to justify that prediction. It has practically tripled the country's uranium reserves; from 66,800 tons in 1977, the figure went up to 193,500 during the last quarter. This, among other things, helped Brazil extricate itself from an insignificant position in order to assume a place among the world's five biggest uranium producers. Inspired by this figure, the minister of mines and energy revealed that, before taking over, he had been visited by representatives of other countries interested in signing uranium supply contracts. "There is nothing to prevent us from listening to those requests, especially now that we have already found this mineral in a volume greater than needed to cover our requirements," the minister explained.

It took 20 years of systematic prospecting for radioactive minerals to reach that stage. The work began in 1952, stimulated by the National Research Council; 10 years later, prospecting responsibility was shifted to the National Nuclear Energy Commission and in 1974 responsibility was transferred to NUCLEBRAS which had substantial resources. During that time, seven uranium reserves were located: Pocos de Caldas and the Iron Quadrilateral, in Minas Gerais; Figueira, in Parana; Amarinopolis and Campos Belos, in Goias; Itataia in Ceara; and Lagoa Real, in Bahia. In addition to that, NUCLAM [NUCLEBRAS Mining Auxiliary Company], a subsidiary of NUCLEBRAS in the mining sector, identified the Sao Jose dos Espinharas deposit, in Paraiba.

All of these deposits together have been pointed up as the first result of a vast discovery and prospecting program, considered the second biggest in the Western world, smaller only than the program being carried out in the United States. NUCLEBRAS until last year invested \$117 million in that effort, in other words, close to 2.3 billion cruzeiros. Even so, the minister's intention to register Brazil in the exclusive club of uranium exporters will still take some time. The first tons of completely Brazilian uranium will begin



to be produced on a commercial scale only in the middle of 1981. That is the deadline provided for the start of operation of the Pocos de Caldas industrial complex in Minas Gerais where 500 tons of yellow-cake will be extracted annually; this is ammonium diuranate, a yellow-color concentrate which, after enrichment, is transformed into a fuel element for atomic power plants.

The mine, with a capacity of 30,000 tons, and the processing plant constitute this industrial complex which has been budgeted at \$70 million. Right now, close to 1,500 persons are involved in an effort which engineers call "deposit cleaning." In fact however they are digging in the crater of a volcano which erupted in the Pocos de Caldas Plateau millions of years ago, a tremendous hole with a depth of 300 meters and a diameter of one kilometer. They have already taken 18 million cubic meters of useless material out of it. Another 300 workers, less than 2 kilometers from the mine, are building the plants which will extract the so-called yellow-cake from the radioactive rock.

According to the government time schedule, the Pocos de Caldas complex was supposed to have been operational early in 1979. But the pace of work was changed because the manufacture of yellow-cake will also depend on the installation, in Brazil, of another plant in 1982, the isotope enrichment plant; in other words, the plant that will produce the fuel for the power plants on the basis of the yellow concentrate. In addition to this little new item, engineer Armando Henrique da Conceicao, who is in charge of setting up the mine, explained that the completion of this first project will have to be handled "very gingerly" since it is rather experimental. It will be used to test all the technologies to be used in other deposits. Parallel to the prospecting work, we have a sophisticated chemical and geological analysis laboratory in Pocos de Caldas, equipped to tackle any problem arising in connection with the production of nuclear raw materials.

That laboratory will certainly yield the technical information necessary for getting the second mine going in Brazil. Although nothing specific is available on this point so far, some researchers believe that the Itataia complex, in Goias, will have to be tackled under this priority because of its size. Studies concerning the extraction of the presumed 8,000 tons of uranium are already in a rather advanced stage at Figueira, a village in the township of Foz de Iguaçu, in the northwestern part of Paraná. Contrary to what is being done at Pocos, where we have strip mining, the Paraná deposit will be worked through the underground gallery system. There, uranium appears at a depth of 120 meters and comes in combination with coal--something that will require an expected technology because this is the world's only deposit to feature that combination.

But it is not only the technological novelties that astonish pioneers in uranium exploration in Brazil. By some coincidence, the three main deposits are in areas bordering on two or more townships. The effort to become the headquarters for one of these projects has triggered interesting rivalries which have caused considerable excitement in the existence of these cities in

the interior. In Ceara, for example, the dispute between Santa Quitéria and Itatira, about "the country's biggest uranium deposit," has brought out the creative talents of the inhabitants. During the minister's visit, Santa Quitéria, which has a population of 30,000, sent two brass bands to receive the minister's group. Not to be outdone, Itatira rounded up all available students and sent them to the NUCLEBRAS camp where Cesar Cals delivered a speech. In the end, the two townships were each able to derive a small advantage. While the township of Santa Quitéria was apparently more represented in terms of ceremonies, the kids from Itatira had more contact with the minister.

In Minas, the two townships of Caldas and Pocos de Caldas are involved in a dispute over the ownership of the deposit. The Caldas township benefited from an increase in its budget which went up from 1.2 million cruzeiros to 15 millions and it decided to launch a big promotional effort during former President Geisel's visit to the mine last year. Thus there appeared, in a big newspaper in the country's south, a full-page story about the city that would in the future really be harvesting the fruits of uranium exploration and that would decisively contribute to the country's self-sufficiency in the matter of atomic fuel.

But problems in Parana are not the same since everybody admits that the mine is really located in the little town of Sapoprema. But the locality of Figueira--a town with 10,000 inhabitants close to the NUCLEBRAS construction site--now wants an independent charter for itself. "Many years ago," argues Geraldo Barica Molina, "we should have been trying to establish ourselves as a city because we do have the organizational structure and the population for that. With this uranium mine, we hope that they will consider us at least as a township in terms of national security."

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## BRAZIL

### REPORTAGE ON DENIALS OF SECRET ACCORD FOR PLUTONIUM SALE TO IRAQ

#### Secret Understanding

Rio de Janeiro JORNAL DO BRASIL in Portuguese 23 May 79 p 3

[Text] Kuwait--The newspaper AL QABAS reported yesterday that Brazil and Iraq reached what it called a "secret understanding" on cooperation in the atomic field. The newspaper adds that this agreement includes the sale of plutonium to Iraq by Brazil.

Quoting Washington sources, the newspaper guarantees that the understanding was obtained during the weekend when the vice president of Iraq, Taha Ma'ruf was on a visit to Brasilia. In exchange for plutonium, Iraq pledges to finance the installation of industries in Brazil. It also adds that Iraq decided to buy plutonium from Brazil on the advice of the French Government which is undergoing heavy pressures from Washington to halt the aid it is giving to Iraq, one of the more radical countries, in the atomic field.

#### Itamarati Denies Rumor

Rio de Janeiro JORNAL DO BRASIL in Portuguese 23 May 79 p 3

[Text] Brasilia--Itamarati yesterday denied categorically that Brazil had reached a "secret understanding" with Iraq to provide it with plutonium or for any cooperation in the atomic field. Spokesman Bernardo Pericas declared that the announcement "is entirely ridiculous."

He emphasized that Brazil does not have operating nuclear reactors capable of producing plutonium, which means that the transaction would be impossible.

The spokesman said finally that the manner in which the report was written--keeping in mind that plutonium is the raw material for nuclear weapons--suggests strange objectives which will not be attained anyway because Iraq is a signatory of the nuclear weapons nonproliferation treaty.

## Official Admits Uranium Sale

Rio de Janeiro JORNAL DO BRASIL in Portuguese 23 May 79 p 3

[Excerpts] It is uranium and not plutonium which Brazil has promised to supply to Iraq, according to a high-ranking source from the Mines and Energy Ministry. However, no secret agreement has been signed. There was only a promise to hold negotiation on this on a long term basis. Iraq and Iran are the only two oil-exporting Arab (as published) countries which have nuclear programs that would justify the importing of uranium. In addition to promising to study an agreement to export uranium, Brazil promised to cooperate with that country in some aspects of nuclear technology not covered by the Brazilian-German agreement.

The high-ranking source said that during his visit to Brasil last week, the vice president of Iraq explained that his country does not need money. "We want to insure that in exchange for oil we obtain the collaboration of importing nations in our internal development." Meanwhile, the source added that the Iraqi vice president pressured the Brazilian Government to sign a nuclear agreement as quickly as possible. During the meeting he held with Brazilian authorities he was convinced that this would not be possible. However, there remains the promise to negotiate the guaranteed supply of uranium and cooperation in nuclear research with Iraq on a long term basis.

The commercial nuclear program of Iraq will begin with the already-contracted import of a nuclear reactor of the PWR type (pressurized water like the reactors being built by Brazil). The supplier will be Framatome of France, which uses the Westinghouse technology of the United States under license. Recently, sabotage destroyed components of the nuclear system for steam generation for the reactor which was being built for Iraq in the Framatome factory. The French Government guaranteed at that time that it will honor the contract and that the components will be rebuilt. It is certainly for that reactor that Iraq needs the uranium.

The report that Brazil would export plutonium to Iraq, according to the source, is completely illogical. First of all, because all the processing of uranium (which results in the production of plutonium), which is going to take place in the processing plant that Brazil will build with German technical help, will be covered by the Tripartite Safeguards Agreement signed 26 February 1976 by Brazil and the FRG with the International Atomic Energy Agency. Second, because the pilot reprocessing plant that Brazil is going to install within some years will have a capacity for processing a maximum of two tons of irradiated fuel per year. Depending on the time that the fuel remains within the reactors, between 1 and 2 percent (or between 20 to 40 kilos) of it will become plutonium and not all of that is fissionable.

### Iraqi Ambassador Denies Rumor

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 23 May 79 p 5

[Text] The Iraqi ambassador in Brazil, Fahid Zaidar, declared that during the recent visit by the vice president of his country, Taha Ma'ruf, to Brazil there was no discussion of nuclear cooperation between the two countries. A report in that respect was published by the newspaper AL QABAS of Kuwait in its edition yesterday in which it says that "Brazil and Iraq reached an agreement, a secret agreement," according to the newspaper, "on cooperation in the atomic field which will include the sale of plutonium by Brazil."

However, despite the fact that Brazilian Minister of Mines and Energy Cesar Cals refused to comment on the subject, diplomatic sources confirmed that there was a long meeting between the president of the National Nuclear Energy Commission [CNEN] and Iraqi representatives during the visit by the vice president.

The Iraqi ambassador was categorical: "We have an agreement with France and we do not have the intention of seeking this type of cooperation with other countries, at least not for the time being."

AL QABAS, which quotes Washington sources, said the agreement was obtained during the past weekend and in exchange for the sale of plutonium, Iraq pledged to finance the installation of various industries in the country.

AL QABAS added that Iraq decided to buy plutonium in Brazil on the advice of the French Government, which is under pressure from the United States to halt the help it is giving Iraq in the atomic field.

In Brasilia, it was learned that although there is still no specific information on a possible cooperation between Brazil and Iraq in the atomic field, the two countries supposedly agreed "to exchange ideas shortly" on the subject. The government, according to diplomatic sources, had misgivings about signing contracts or agreements in the nuclear area with Arab countries which are considered radical. An example of that would be the refusal by former Minister of Foreign Affairs Azeredo da Silveira to a similar request from Libya last year.

Minister of Mines and Energy Cesar Cals, in turn, preferred not to say anything on a possible Brazilian-Iraqi agreement, observing that in the next interviews he will analyze only questions having to do with petroleum because he believes that Brazilian foreign policy is the purview of Itamarati.

## Government to Export Uranium

Rio de Janeiro JORNAL DO BRASIL 24 May 79 p 2

[Text] The Brazilian Government intends to export uranium, not only to Iraq but to other countries, particularly the petroleum producers, it was revealed yesterday by a high source of the energy sector, because it believes that it would be a good business to trade uranium for petroleum.

Another country, which has already proposed buying Brazilian uranium, was Nigeria during the visit a Nigerian delegation made to Brazil in March. But there has been no negotiation of any agreement with any country in this respect it was reported by the source. "There is only the idea of providing uranium when we begin to produce," he declared.

### Reserves

Brazilian uranium reserves are 200,000 tons at this time, mainly concentrated in Itatira in Ceara. However, the first Brazilian uranium mine is the one at Pocos de Caldas in Minas Gerais, where an ore concentration plant is being built.

Present reserves are sufficient for attending to the needs of 45 nuclear powerplants of the Angra II type for their entire useful life. According to law, the country can export uranium after the needs of the domestic market are attended to, and there is also a commitment to sell Germany 20 percent of the ore discovered by NUCLAM [Mining Assistance Inc.] a Brazilian-German enterprise which is prospecting in a part of national territory. The bulk of those reserves, however, was discovered by NUCLEBRAS [Brazilian Nuclear Corporations] itself without any help from the Germans.

### Plutonium

With respect to the story published by an Iraqi newspaper that Brazil has an agreement to provide plutonium to that country, the same source of the energy sector described the story as "absurd," saying that it would not be possible to make an agreement of that nature since it is not yet even known under what conditions Brazil may make use of the plutonium resulting from the reprocessing of the spent fuel from the Brazilian powerplants.

In the case of Angra I, whose fuel was provided by the United States, the contract foresees the holding of new negotiations in the future to decide whether the fuel will be reprocessed here or in the United States, and in either of the two cases, with whom the plutonium would remain. In the case of Angra II and Angra III, the plants bought from the FRG, whose fuel will be furnished by URENCO, an Anglo-German-Dutch company, the storage of the plutonium is still being negotiated. Holland is urging

that the plutonium remain under international control, under custody. Even if Brazil were to find a use for it in fast-breeder reactors, which for the time being are not being operated commercially, the plutonium will have to remain under international custody.

"At any rate," concluded the source, "any export of plutonium would have to be in agreement with all interests, included those of the countries providing the fuel."

#### Exports To Be Small

Rio de Janeiro JORNAL DO BRASIL in Portuguese 25 May 79 p 17

[Text] Sao Paulo--The export of Brazilian uranium to petroleum exporting countries "is not a bad idea but has no great significance for the balance of payments of Brazil," according to a statement yesterday by Professor Jose Goldenberg, president of the Brazilian Physics Association.

Observing that exports "should refer to natural uranium and not enriched uranium," Professor Goldenberg recalled that in the OPEC area "only Iran has a large nuclear program which is being completely deactivated by the new regime." The nuclear programs of Iraq and Nigeria are small and it is not very likely that they will acquire very large amounts of uranium.

Physicist Jose Goldenberg said that there will be no uranium enrichment capability in Brazil before 1985 even if the method of centrifugal jets shows itself to be industrially viable, something which has not yet been demonstrated."

#### Nuclear Program Safety Questioned

Sao Paulo FOLHA DE SAO PAULO in Portuguese 24 May 79 p 2

[Article by Luiz Alberto Bahia: "Confessed Nuclear Unsafeness"]

[Text] It may seem absurd that there is thought of selling plutonium produced in Brazil to Iraq simply because we do not have any plutonium. And it will take some time before we can produce that pernicious product of human ingenuity in such an amount that we can export it to a radical country such as Iraq.

However if the story on the sale revealed by the newspaper of Kuwait is not true it is believable. Does, or does not the nuclear program find its main justification in the export of enriched uranium? At least Minister Cals believes that we should not lose the opportunity to export enriched uranium as soon as we have acquired such a capability. And why not also export plutonium as soon as we are able to produce it on a large enough scale? It is within the logic of the Brazilian Government



support for the "plutoniumization" of the world for the country to sell the aforementioned byproduct of human evil genius to any buyer.

It is useless, therefore, to deny something that will be probable as soon as the policy of "plutoniumization" in Brazil reaches its consequences. After all, we have to pay for the beans and rice we import.

The supposition that the plutonium we would be able to produce beyond our needs has a sure destination in the market in Germany or no destination at all, allows and authorizes the speculation that either we or the Germans are going to stockpile surplus plutonium; that which is not consumed by the powerplants of the two countries. Stockpile unsafeness, since the Brazilian elite in power truly seek to learn so as to acquire the regenerative reactors, it is improbable that one day our capability will not translate into exports and it is for that the elite in power are working zealously.

Let us put aside the future of a world filled with plutonium with Brazilian help. Let us think about the present with the already existing dangers already recognized by the Brazilian Government itself. According to the news, the Brazilian Government, through its ambassador in Austria, sent a letter yesterday to the director general of the International Atomic Energy Commission asking for an examination "by the international community," of the question of nuclear reactor safety "so that nuclear energy may be used in an increasingly safer and efficient way for the benefit of humanity."

It is important that the government of the nuclear program recognize that there is a problem of safety so serious with respect to nuclear reactors that it urges an examination by the international community. In other more realistic and true terms the Brazilian Government recognizes that there is unsafeness in the operation of nuclear reactors at the present technological stage. But not even because of that does the Brazilian Government discard the theory that nuclear energy can be tamed and placed at the service of humanity without any great danger.

This means that there is unsafeness but that we must accept it until the time comes when there is a minimum of unsafeness. Such a position could be seriously argued in a country in desperate need of electrical energy but not in a country rich in unexploited waterpower resources. The correct position would be to choose alternate forms of energy; never that one which contains ecological dangers recognized by the government itself. At not only by us. One of the pioneer countries in nuclear energy, the United States, with its water resources fully used, decided to suspend licenses for the construction or operation of nuclear powerplants for 1 months until all the truth is known about the incident at the Three Mile plant. The nuclear moratorium is the only sensible thing to do in view of the doubts aroused by the episode that alarmed the world.

Instead of a moratorium the Brazilian Government turns to the international community with words of a good Franciscan and it moves its nuclear program forward. Such behavior is only possible because in Brazil the antinuclear forces and the groups against the pollution of the environment cannot go to Brasilia to protest and be received by the president of the republic.

It is even more frightening that the Catholic Church in Brazil does not mobilize public opinion against the nuclear program despite the fact that it is aware of the dangers involved in an area where man still works as a sorcerer's apprentice. The only organized Brazilian force capable of mobilizing opinion against a program of uncertainties and dangers is missing, it being true that the dangers will be greater with the absurd concentration of powerplants--which are unsafe according to Brazilian acknowledgement--in the overpopulated area of the country.

If the prudent actions by the pioneer country in nuclear energy were not enough, the example of Switzerland, an energy dependent country, would be. The Swiss voters approved proposals by the government to adopt legislation requiring that the construction of new powerplants be approved by both houses of Parliament, which will only grant permission if it believes them to be absolutely necessary for the energy of the country.

What is the urgency of the Brazilian nuclear program that it is disputing markets and factors with other higher priority sectors? It is possible to answer: There is no urgency for any balanced person not dominated by impulses of megalomania nurtured by the Angra dos Reis program.

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# VICE PRESIDENT TERMS NUCLEAR TIMETABLE FLEXIBLE

Rio de Janeiro JORNAL DO BRASIL in Portuguese 6 Jun 79 p 17 PY

[Excerpts] After lecturing at the opening of the national symposium on conventional and alternate energy sources, sponsored by the Chamber of Deputies, Vice President Aureliano Chaves said that "the Brazilian-FRG nuclear agreement should not necessarily be tied to the timetable of installation of nuclear plants. The nuclear agreement is one thing and the execution of projects under the nuclear program is another thing."

He noted that the nuclear agreement is indispensable for the country to acquire mastery over nuclear technology which will provide an alternate energy source which Brazil cannot do without. Vice President Chaves then said that for that reason "the nuclear agreement is sacred, but not the timetable for installation of the nuclear plants. The government can review this timetable whenever it finds it necessary to adjust it to the domestic and international energy situation." In his lecture, Vice President Chaves--an engineer--explained that no matter how abundant our hydroelectric potential is, we cannot set aside thermal energy sources. "In view of the growing oil prices, nuclear energy constitutes a viable alternative," he said.

The vice president defended the nuclear program, which "will guarantee the electric system based mostly on hydroelectricity against rainfall fluctuations," as well as the inter-connection by transmission lines of the various river basins which are being hydroelectrically exploited. Vice President Chaves noted that the hydroelectric potential has been exploited so far by tapping only the most advantageous of our river basins, economically speaking. "If we should go with a fine-toothed comb over our rivers in the southern and south-eastern regions, keeping in mind the new factors related mainly to the higher oil prices, we will certainly find other suitable sites for the installation of more hydroelectric plants," the vice president said.

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## BRAZIL

### CTA OFFICIAL SCORES U.S. PRESSURES AGAINST NUCLEAR PROGRAM

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 31 May 79 p 9

[Text] Sao Jose dos Campos--Proven Brazilian uranium reserves are 142,300 tons, and those of thorium--the largest in the world--amount to 1.27 million tons, it was reported yesterday in Sao Jose dos Campos by Lt Col Jose Alberto Albano do Amarante, head of the Advanced Studies Division of the Aerospace Technical Center (CTA), connected with the nuclear program through the National Security Council.

The officer emphasized that these reserves result from explorations made in only about 15 percent of the national territory and that he believes Brazilian energy potential is "certainly much more abundant and will enable the nation to declare its technological independence and continue its development program for more than a century."

According to Lieutenant Colonel Amarante's estimates, by 1990 to 1995 Brazil will have harnessed all its hydroelectric potential, estimated at 100,000 megawatts in the South-Southeast region. He asserts the hydroelectric potential of the North region--also estimated at 100,000 megawatts--should be used locally and in the Northeast region, "since the cost of transmission lines would make supplying the South-Southeast region infeasible."

From that point on, the head of the CTA Advanced Studies Division believes Brazil will utilize its known reserves of uranium and thorium, "enabling the nation to generate energy equivalent to 75 years of the total that would be generated by the hydroelectric potential."

#### 'Half-Truths'

Lieutenant Colonel Albano Amarante took the initiative of calling a press conference in response to what he calls the current attitude "of half-truths that are being given the public, for the purpose of compromising the nuclear program, serving the interests of nations that do not want Brazil to achieve technological independence."

He said he does not understand the motives for the "totally unfounded" dissenting reports released by scientists "that only result in causing public apprehension about the nuclear program." Amarante considers opposition by physicists to the program "natural, since the initiative of generating energy and mastering technology is being taken by the nuclear engineers.

"The Brazilian nuclear program has been subject to strong pressures from the United States," he asserted, "as was that of the Soviet Union, instigated by vulnerable economic interests. This pressure is exerted on the basis of an absurd dread of nuclear-weapons proliferation, but its purpose is to prevent having another competitor in the technological field."

He also gave his official assurance that the nuclear program will cost the nation about \$15 billion by 1995, and will produce 15 percent of the energy consumed in Brazil during that period.

He added that it is fundamentally important for the public to have complete knowledge of all details of the Brazilian nuclear program. The head of the CTA Advanced Studies Division said he was upset about the report--also released in Sao Jose dos Campos--by physicist Rogerio Cerqueira Leite to the effect that the program will cost the country \$30 billion by 1995 and generate only 3 percent of the energy needed in Brazil.

Alhano Amarante stressed that, beyond these figures being absurd, the purpose of the nuclear program is not just to generate energy--replacing hydroelectric power, which will be scarce after 1990--"but also to give Brazil the technology needed to assure its independence at the end of the century and be on a par with the more developed nations."

#### Competitors

In asserting that the nation has a right to technological independence, the lieutenant colonel said outside pressure was increased after the Brazil-Fro agreement "because it enables us to achieve complete mastery of the nuclear fuel cycle.

"The concern of our competitors," he emphasized, "is to prevent our achieving mastery of the most advanced nuclear-energy technology through enrichment of uranium 235 and reprocessing of this fuel, which enables us to obtain plutonium 239."

This knowledge--which is considered the significant part of a nuclear program--is subject to the most criticism in developed countries, through demonstrations of dissent, ostensibly related to the danger of nuclear-weapons proliferation.

The chief of the CTA Advanced Studies Division believes "such a concern is absurd, because Brazil agreed to the safeguard rules (Moscow Treaty), which are far more rigid than those of the discriminatory Tlateloleo Non-proliferation Treaty."

## Benefits

Lieutenant Colonel Amarante stated that complete development of a technology takes 30 to 40 years and justified the agreement with the FRC as a way for Brazil to take shortcuts, "rather than having to spend 10 to 20 years in arriving at the point where other nations are now." He also said the Brazilian Nuclear Program will involve the whole nation by furnishing up-to-date technology, thus benefiting domestic industry and leading to "an enormous savings in foreign exchange."

He cited the example of the space program, which developed seamless steel tubing and transferred this technology to domestic industry: "Through this development alone the nation is already saving \$1 million a month in foreign exchange. The nuclear program, from the strategic point of view, will enable the nation to be on a par with developed nations. And at each step the reaction is enormous, because those countries do not want competitors."

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# FORTY SCIENTISTS DOING NUCLEAR-RELATED RESEARCH IN NITEROI

Rio de Janeiro O GLOBO in Portuguese 5 Jun 79 p 12

[Text] Forty Brazilian scientists, most of them with graduate degrees earned abroad, are working in varied research related to nuclear physics at the Federal University of Rio de Janeiro State (UFF) in Niteroi. They belong to five institutions responsible for carrying out the National Plasma Physics Program. This is a branch of physics devoted to accomplishing nuclear fusion, a new source of atomic energy that would have the advantage, in comparison to fission, of not leaving radioactive wastes or residues.

The 40 scientists are professors from the UFF graduate course, Campinas University, Rio Grande do Sul and Sao Paulo federal universities and the National Space Research Institute. Some projects they are working on have already had specific results, such as construction of an N<sub>2</sub> (nitrogen) laser.

According to the coordinator of the UFF graduate course in physics, Prof Ottilia Ballon, in order to get nuclear fusion, plasma (a gas of ionized particles) must be confined and heated to very high temperatures, which is being tried in the United States and other advanced countries by using magnetic fields.

In nuclear fusion, Professor Ottilia explained, the process is the inverse of fission, now used for producing atomic energy. Whereas in fission energy is obtained by splitting the atom into two lighter and radioactive ones, in fusion energy is produced by joining two light atoms to form a heavier one.

The UFF group of scientists--five with doctorates and five with master's degrees in physics--working on the National Plasma Physics Program research is responsible for diagnoses, "developing techniques to measure macroscopic plasma parameters such as temperature, pressure, magnetic field and density."

## BRAZIL

### DEVELOPING COUNTRIES SEEK NUCLEAR COOPERATION

#### Nuclear Engineering Assistance

PY180130 Sao Paulo O ESTADO DE SAO PAULO in Portuguese 16 May 79 p 5 PY

[Text] Brasilia--Brazilian Government nuclear officials have reported that although Mines and Energy Minister Cesar Cals did not mention names last Monday, the following are some of the developing countries which want to sign agreements with Brazil on technical cooperation in the nuclear sector: South Korea, Libya, Indonesia, Argentina, Chile and Peru. They added that Brazil has special interest in these agreements, but there are some restrictions of a political nature.

The sources added that Brazil can now only offer technical assistance in nuclear engineering, and that it should wait to obtain some practical results before committing itself to offering technical assistance in other areas or to exchange information. The FRG Government, which was briefed on these consultations, reportedly has no objection to the interests expressed by developing nations.

Chile, for instance, has made consultations on building reactors in partnership with Brazil. There has, however, been strong opposition to any rapprochement with Libya in the nuclear field since the time of former Foreign Minister Azeredo da Silveira.

#### Joint Latin American Nuclear Program Proposed

Sao Paulo FOLHA DE SAO PAULO in Portuguese 16 May 79 p 6

[Text] Rio. The secretary-general of the Brazilian Society for Progress in Science, Rio, the nuclear physicist Enio Candotti, suggested that Brazil join Argentina, Peru, Mexico, Venezuela, and other South American countries for the purpose of establishing intensive scientific and technological cooperation in the nuclear area as a way to restore the tradition of collaboration for peaceful purposes attributed to the nature of the Brazilian people and as a way to increase the bargaining capacity in dealing with the Nuclear Non-proliferation Treaty.

Enio Candotti's proposal was submitted on Tuesday in the name of the nation's scientific community to the general meeting of 150 persons in the auditorium

of the Brazilian Press Association to debate "The Nuclear Issue: Reactor Safety and Participation of Scientists."

For Enio Candotti, "there is no longer any sense in discussing a nuclear accord drawn up in terms of military prestige by commercial enterprises which avoid criticisms and debate with public opinion, where billions are at stake and nobody can hope to have his alternate proposals considered." For him, discussing the issue only from the technical viewpoint is of no interest to us and diverts us from the central issues, in other words, "whether or not it is worthwhile for Brazil to develop nuclear energy and whether this is indeed one of the objectives for the next 50 years."

"The nuclear accord is a package that has a commercial objective and will not create conditions for the transfer of technology to Brazil, no matter how great our efforts may be. We are training a generation of engineers to absorb German technology. It is as if we were in an airplane, on a long trip, where the relief crew is being trained on the way," he added. "We must remember that we have some partners very close to us, such as Argentina, for example, and they should be consulted regarding any future collaboration. Both Brazil and Argentina are against the Nuclear Nonproliferation Treaty. That country quite rationally is our ideal ally," he continued.

"On the basis of a specific proposal for South American scientific and technological collaboration in the nuclear fields, we could eliminate any possible disputes and misunderstandings, such as the Itaipu and Corpus question which is clearly sustained by forces that want to keep South America under their hegemony, stirring up rivalries that run counter to the nature of our peoples."

Alex Vazire Alves, executive director of the CNEN (National Nuclear Energy Commission) asserted during the debates that "there is no military connotation whatsoever to the Brazilian nuclear program because, if there were, it would not be done in this fashion. There is a gentlemen's agreement between the Brazilian and Argentine governments, permitting reciprocal visits by scientists to nuclear installations. There is no arms race between the two countries and cooperation has been increased considerably in recent times."

In his final remarks, nuclear physicist Luis Pinguelli Rosa, one of the debaters, said that he is absolutely convinced that "there is no need for nuclear energy in Brazil because we have energy for the next 30 years."

He criticized the participation of the MDB [Brazilian Democratic Movement], saying that "the opposition party has abandoned the nuclear CPI [Congressional Investigating Committee] and does not adopt a clear position with respect to the nuclear accord. The accord is a sellout."

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CNEN HEAD TESTIFIES ON POLICY, ANGRA II SITE ERROR, DELAYS

Policies, Prospects

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 3 Jun 79 p 8

[Text] Brasilia--Hervasio de Carvalho, president of the National Nuclear Energy Commission, said yesterday that the Western world is now aware that world petroleum reserves, "in large part located in the explosive Middle East, are no longer a reliable, cheap and--much less--inexhaustible source of energy." It is his opinion that mankind, besides using all energy more rationally and economically, must now make global plans involving all energy sources, their possibilities and their peculiarities.

The CNEN [National Nuclear Energy Commission] president said it has been clear since 1973 that national energy planning must give priority to the least foreign dependency possible. He added that, since some countries have large reserves of coal, it, for example, could regain its importance. He also foresaw the possibility of economic production of hydrogenated fuels nearly competitive with petroleum, as well as industrialization of oilshale and bituminous sands.

Hervasio de Carvalho contended that petroleum is increasingly being viewed as a special product, to be used as raw material for petrochemicals. He added that nuclear energy--considering the scarcity of fossil fuels, the fact that no other form of energy is sufficiently developed and reliable and its competitiveness with other fuels--"is the only alternative available to overcome the expected medium-term energy deficit." The CNEN president says Brazil will use this type of energy for peaceful purposes only, emphasizing the government's national nuclear energy policy, which is "completely committed to peace and limitation of nuclear weapons." This policy, according to Hervasio de Carvalho, covers the following aspects: 1. The right to use nuclear energy as a predominate factor in national development, "in defense of our security and as a prospect for the progress of all Latin America"; 2. Collaboration with countries "more advanced in the field," in order to establish domestic technology as well as founding a nuclear industry in Brazil; 3. Cooperation with nations whose technical level is "equivalent to ours," particularly in Latin America; 4. Collaboration by Brazil in total prohibition of nuclear weapons throughout the



world "in support of world peace," through establishing treaties "prepared within the international organizations to which we belong"; as well as adoption of objective, realistic and fair measures which, "while guaranteeing attainment of such desirable goals, will not be transformed into a means for restricting development of non-nuclear nations."

The CNEN president also said the persisting doubts about nuclear-energy safety show that communication between the agency he heads and the Brazilian public "has not been performed in a way that one would desire." Hervasio de Carvalho asserted that technical problems "absolutely commonplace in conventional engineering and that by no means affect critical nuclear areas assume apocalyptic connotations when coupled with the word 'nuclear.'" Hervasio de Carvalho added, always defending installation of nuclear energy in Brazil, that despite the accident in Harrisburg worldwide experience has proven that industrial utilization of nuclear energy "has a safety performance record than any other human activity."

Hervasio de Carvalho also considered it important that the CNEN receive the support "at all echelons of government, Congress, public opinion and the communications media, in order to accomplish the task of guaranteeing safety in spite of naturally antagonistic commercial interests." The CNEN president praised the Nuclear CPI [Congressional Investigating Committee], and considered it "especially praiseworthy that Congress is completely fulfilling its duties, contributing to this objective with the means at its disposal, within an open democratic system."

#### Angra-II Site Errors

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 1 Jan 79 p. 7

(Text) Brasilia--Hervasio de Carvalho, president of the National Nuclear Energy Commission (CNEN) said yesterday, during his second day of testimony before the Nuclear CPI, that there were serious errors in preparing the plan for the Angra-II nuclear power plant, explaining that exact calculations about the region's seismic problems were not made. Even so, Hervasio de Carvalho defended the position that the power plant should remain where it is, "even if it is necessary to sink 4,000 piles." He concluded that, beyond not being ashamed to confess its faults, "the nation must build nuclear power plants now, because it will soon need this energy very much."

The CNEN president said that the government technicians should feel embarrassed in acknowledging that the errors were serious, stressing, however, that there never in any country that is establishing a nuclear program, Hervasio de Carvalho said everything that was done improperly has been discovered and can be corrected, although the nation must pay a very high price for the experience. He also adds that the mistakes should not be repeated in Angra III, "since its location is more favorable."



According to Hervasio de Carvalho, Brazil has always been a peaceful nation, "completely opposed to use of nuclear weapons and aware that it is necessary to do away with any type of weapon." He said the government never pursued any military objective, since all its actions in the nuclear field are solely for peaceful purposes. This policy, in the CNEN president's opinion, "gives moral force to Brazil, which has an important voice in international discussions of this nature." This policy, according to him, is due to the fact that government technicians have "an essentially accurate idea that a nuclear catastrophe would be the end of mankind." In the opinion of Hervasio de Carvalho, Brazilian scientists would never cooperate in "such a monstrosity."

In answer to a question from Senator Milton Cabral (ARENA [National Renewal Alliance]-PB [Paraíba]), who is chairman of the CPI, Hervasio de Carvalho said he does not know of any defense against use of nuclear weapons, should a war of that type break out. And although some way of defending the population may exist, as in the case of the United States, for example, that country's lack of preparation, he says, "is so great that when the Pennsylvania nuclear accident occurred it took 10 days to get 400,000 potassium iodide tablets to pass out to the population." And he added: "At that, it was hell getting the stuff." He mentioned that the Russians, however, are preparing for nuclear conflicts, building underground shelters, "but no provisions have been made on our side." He said that he has heard of groups of people in Brazil who are preparing to face problems of this nature but he has no more detailed information about the matter.

#### United States

After relating the discussions between Brazil and the United States in this area, the CNEN president revealed that he made efforts for the agreement signed with FBN to be made with the Americans, "but it was not possible due to the well-known problems." He added that since 1951 the United States, through its Nuclear Energy Commission, has considered Brazil potentially capable of obtaining the technology for enriching uranium, and also able to "eventually have a military program." Admiral Alvaro Ribeiro, according to Hervasio de Carvalho, "argued with them because he intended to install centrifuges in Brazil, acquired from Germany."

The CNEN president, however, praised the U.S. coal potential, which, in his opinion, will not have exhausted its deposits for at least 200 more years. He added, in response to a question from Senator Dirceu Cardoso (PMDB [Brazilian Democratic Movement]-ES [Espírito Santo]), that he does not believe in the immediate exhaustion of fossil fuels over the short term, as stated repeatedly by experts in various parts of the world. He warned, however, that fossil fuel deposits must be used economically, so they will not be used up sooner than expected. In that case, Hervasio de Carvalho believes there would also be dangers of an ecological nature, since carboniferous pollution, for example, causes much more harm to the population than does nuclear pollution.

In again mentioning, at another point in his testimony; the Angra-II question, the CNE's president reiterated his position that the errors occurring during construction of the nuclear power plants were inevitable. In the Brazilian case, according to Herveasio de Carvalho, there are options for dealing with the problem of large loose boulders coming from decomposing rock. "One of them consists of installing a layer of rubber to absorb the impacts, a solution that has shown good results in French units for 15 years," he explained. Herveasio de Carvalho asserted that in any solution to be arrived at to reinforce the piles the National Nuclear Energy Commission must have the final word after an exhaustive examination of the suggestions that are made. Even in this way, permission should only be granted "after much consideration, when there is absolute safety." He added that when the Angra II construction plan was made, it was thought that the rock (where the power station is located) was elevated (in the direction of the surface, and only later learned that just the opposite occurred. "That is why it was necessary to install piles of up to 70 meters in depth," again repeating the need to leave Angra III in the planned location.

#### Design Error Admitted

PYH11821 Porto Alegre Radio Gaucha in Portuguese 1130 GMT 1 Jun 79 PY

(Alex) The total cost of the complete Angra II nuclear plant project will be \$6.44 billion, Herveasio Guimaraes de Carvalho, president of the National Nuclear Energy Commission, said in testifying to the Senate CPI which is investigating the Brazil-FRG nuclear agreement. Guimaraes de Carvalho also said that the designers of the nuclear plant made a tactical mistake in choosing the site on Itaorna Beach, which has complicated the execution of the project. Professor Jose Goldemberg has also severely criticized the installation of nuclear plants in Brazil, terming frivolous the technicians who say they have complete control over the area. Goldemberg feels that building nuclear plants is tantamount to keeping an atomic bomb at home.

#### Construction Delays

BR11110 ESTADO DE SAO PAULO in Portuguese 31 May 79 p 9

(Yam) Brazilian Herveasio de Carvalho, president of the National Nuclear Energy Commission, in testifying yesterday at the Nuclear CPI, said that, due to the constant delays in Angra I and Angra II, "construction of the power plants originally planned to enter into commercial operation by 1990 has become impossible in such a short time." He added that the agreement signed with the FRG, "the only one in the world, was signed on the unique occasion when it was possible, and probably no other nation will obtain another one like it," stressing that Brazil can only profit from this.

According to Hervasio de Carvalho, the Club of London was inspired by the United States when, upon losing its reliability as the country supplying the fuel, desired, "through offensive police action--exercised in this case by third parties--to continue indirectly dominating nations purchasing nuclear technology." He recalled the "current difficulties of Argentina, which wants to build a heavy-water industrial power plant, essential to its fuel cycle, and which is facing all sorts of obstacles, although it is in an extraordinary and favorable bargaining position."

#### The Testimony

The CNEN president advocated installing nuclear energy in Brazil, alleging that there was no other solution to the future Brazilian energy crisis. Carvalho criticized the Nuclear CPI for believing that it was only formed due to the revelations in the German magazine DER SPIEGEL, which, according to Hervasio, "surprisingly was examined only partially." He said that another article, entitled "We Were Not Informed," which contests the statements made in the first part of the material, was forgotten, thus misrepresenting the magazine's real intention, which was to give more complete information. Hervasio de Carvalho said that "it causes profound surprise to anyone who has thumbed through the magazine, that only half the article has been cited and that only from the unfavorable angle."

The CNEN president said that former President Ernesto Geisel's decision to authorize signing the nuclear agreement with the FRG was a political step "of great magnitude," the beginning of which was already prepared in the time of former President Costa e Silva. At that time, it was the then minister of mines and energy and now president of the Itaipu binational enterprise, General Costa Cavalcanti, who held discussions abroad with various governments and enterprises which later resulted in the agreement with the FRG.

In the estimation of Hervasio de Carvalho, the Brazilian policy in the nuclear sector "is correct," and the number of power plants planned is a necessary minimum for establishing a nuclear industry. He warranted that the 1,400 potential to be installed is compatible with forecasts of the nation's needs regarding the thermal complement needed to "support in various ways the program for installing hydroelectric power stations." According to Hervasio, the so-called Plan 90 of ELETROBRAS (Brazilian Electric Company, Inc.) provides for construction of two units of 1,200 megawatts, besides Angra 1, by 1985, but the following ones, in his opinion, would not need to be begun before 1979, as alternatives correspond to the construction of four to six new units with the same power are being prepared. The thermal complement, according to the CNEN president, will necessarily lead to an intensification of the national nuclear and electricity programs at the end of the century. He added that, should the power plants planned in the agreement not be constructed, the FRG would not feel itself obligated to furnish the important reprocessing and uranium-enrichment technologies. Hervasio feels that Brazil is not purchasing ready-made power plants, but rather complete technology for the fuel cycle, and

the government is paying "the price of its development and independence, a price that all nations must pay."

It would not make sense to him, and "it would be very harmful to the nation's interests" to pay a high price "for simply acquiring black boxes," since all that would be needed for this would be to hold an international bidding to choose the suppliers offering the best cost per kilowatt during the useful life of the power plant." The objective of the agreement signed with the FEG, according to Hervaldo de Carvalho, is complete mastery of the technology, which, together with the uranium reserves, will bring about future energy independence in regard to importing fuels.

#### Aureliano

Although the matter has not yet been decided, a member of the Nuclear CPI said yesterday that the vice president of the republic, Aureliano Chaves, should be invited to discuss the Brazilian nuclear panorama. It was he, as the LSEN president mentioned, who, when he was a federal deputy from Minas Gerais in 1969, was chairman of a CPI on the same subject in the Chamber of Deputies and who called the government's attention to the importance of nuclear energy in Brazilian development. Hervaldo de Carvalho recalled that the congressional study at that time made it possible for Brazil to definitely enter this area, adding that the final report of the chairman at that time asserted that the nation, in entering the nuclear area, "was making possible not only purchase of nuclear equipment, but also the presence of the nation at a growing rate in the manufacture of that same equipment."

At another point in his testimony, in answering a question by Senator Vinícius Montoro (MDB-SP[Sao Paulo]), Hervaldo de Carvalho said that Brazil and the FEG, in signing the nuclear agreement, had characteristics and internal and external factors that put them in a position of complementarity. The complex international conditions, according to the witness, did not yet present the severe restrictions against transfer of nuclear technology that exist today. The Brazilian characteristics, he feels, assured "high reliability for a potential partner: strategic geographic position in Latin America, vast territory with natural resources and unexplored areas, large and growing population, administrative continuity and a high rate of economic growth, as we were at the height of the economic boom."

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## CRAZIL

### NEW IEA SUPERINTENDENT INSTALLED, NUCLEBRAS INTERVENTION DENIED

#### Amorim Becomes New Chief

Sao Paulo FOLHA DE SAO PAULO in Portuguese 5 Jun 79 p 24

[Text] As he assumed the superintendency of the IEA--Atomic Energy Institute--yesterday morning [The IEA has become the INEN, the Energy and Nuclear Research Institute], Col Ernanin Amorim categorically denied that his assumption of the office represents a federal intervention in the agency, adding that "my assumption of the office is a simple routine action having nothing to do with administrative excesses, embezzlement of funds or distortions of the mission of the institute."

Planalto Palace in Brasilia distributed an official note denying that the IEA had been taken over by NUCLEBRAS [Brazilian Nuclear Corporations].

Col Ernanin Amorim, who is a member of the National Nuclear Energy Commission [CNEN], replaced Doctor and Physicist Romulo Pieroni, who was relieved of the IEA superintendency last 16 March "at his request"--according to Secretary of Industry, Commerce, Science and Technology Oswaldo Palma, who during the swearing-in ceremony held at the headquarters of the agency and in the presence of CNEN President Evasio Carvalho, more than once emphasized the "important services performed by Romulo Pieroni for the institute, the state and the country."

Before swearing in the new superintendent of the Energy and Nuclear Research Institute, Secretary Oswaldo Palma, together with Evasio Carvalho and the rector of the University of Sao Paulo, Waldir Muniz Oliva, as well as the representatives of the Secretariats of Finance and Planning, elected the new Deliberative Council of the agency. During the meeting, to which newsmen were not allowed, one of the directors of the institute linked to the former administration, who preferred not to be identified, argued that "with the changes no one will be able to speak for this or that directorate," and hastened to defend the former superintendent of the IEA, now the Energy and Nuclear Research Institute, saying that "none of the accusations made have the slightest validity."

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According to charges by scientists of the IEA, which was studied by the National Security Council, the price of the equipment established at 40 million cruzeiros plus additional cost of the test section purchased from Kern Forschungs Anlage Julich and the cooling tower, are valued at 400,000 cruzeiros.

Among the charges made to the National Security Council were the wrongful appropriation of substantial amounts of money for the transportation and installation of the equipment, because the equipment identical to that bought by the Julich Research Institute in Germany cost only 8 million cruzeiros at the rate of exchange at that time.

At any rate, the helium circuit of the IEA did not serve the purposes of the institute and was deactivated in 1976 and was in operation for only 1 year. For all this Pieroni was in Brazil for 18 months before the National Security Council.

At that time, NUCLEBRAS declared that the experimental helium circuit could not be used in research on the technology of the nuclear reactors which Brazil is still going to develop.

This equipment allegedly is only one of the many deactivated pieces of equipment in the storage warehouses of the institute. Still in July 1976, it surfaced the sidetracking of other materials similarly deactivated and stored in the warehouses. This sidetracked equipment had a value of 3 million cruzeiros and its disappearance from the institute led the Secretariat of Finance to dispatch a team of three investigators to look into the disappearance.

Among irregularities there was also the purchase of sophisticated installations in 1974 and 1975. One of them was a computer system which the superintendency could establish the whereabouts of by means of 13 terminals. Another extravagance was the purchase of a communication system which was supposed to have been used by the researchers in their "conversations." Everything that this equipment was printed on a central piece of equipment installed in the superintendency for scrutiny by Pieroni.

Both pieces of equipment used only for overseeing the work of the researchers, were deactivated months after having been purchased because the officials avoided using them to prevent being exposed to irregularities revealed by FOLHA at the time were never disclosed to the superintendency of the IEA, which prohibited access to information from any publication.



## Unsafe Uranium Storage

Sao Paulo FOLHA DE SAO PAULO in Portuguese 4 Jun

[Article by Eneas Macedo Filho: "Uranium Stored

[Text] In the midst of an effort by the authorities swearing-in of the new IEA superintendent to erase intervention from the ceremony, there arose new irregularities in the institute which cannot be disguised. A load of uranium, enough for the manufacture of stored in the institute under hazardous conditions has a radioactive waste disposal dump which violates established by the International Atomic Energy Agency.

These irregularities, added to others already pointed responsible for the replacement of the superintendent yesterday. Even within the institute there were replacement or that Colonel Ernani would be the new the only internal memorandum on the subject, disseminated ago, said only that Ernani Amorim would come to replace Pieroni, but to advise him.

At the time of that memorandum, Romulo Pieroni had behind closed doors with all IEA coordinators, at these trusted men to avoid giving any compromising were questioned on irregularities by the new superintendent of the meeting. disgusted at his dismissal, he was "I am still going to be around at the top."

Despite his revanchist intention, according to the scientific circles, it is actually unlikely that of the institute will return. If the decline suffered administration were not enough, the scientists yesterday in which his departure took place: the federation submitted a triple list to Governor Paulo Maluf of Pieroni followers were named. Quite the contrary.

Symptomatically heading the list was the name of Colonel Ernani of the Military Engineering Institute and Luis Cintra do Prado, adviser for nuclear affairs [Power Plants] and Marcelo Dany de Souza Santos, dismissed by the Revolution and a declared enemy of preceded in the superintendency in a controversial. The "selection" by Maluf could not be more obvious subtlety of the list.

### Unusual Irregularities

There was a holiday atmosphere among the officials of the IEA. This euphoria was summarized by federal Deputy Horacio Ortiz, a university professor and obdurate critic of Pieroni, who has already denounced several times:

"It seems to me that the concentration camp into which the IEA was transformed in the past 18 years is now going to end. Col. Pieroni must not be ashamed of his status as interventor because of the corruption and personal persecution of the administrators. These are well-known. It is up to the new superintendent, a specialist of well-known ability, to put an end to this and clear up the irregularities himself."

In addition to the abnormalities already known and reported, others were heard yesterday.

It was unknown up to then that the IEA stored a quantity of atomic material in Germany, Japan and the United States in unsafe conditions. It was enough for the construction of two atomic bombs, although it was stored in a suitable storage facility in the Nuclear Metallurgy Institute, covered with plastic sheets and stored in an ordinary building structure.

The night watchmen of the IEA, at this time of year, were afraid of some balloon from falling on the roof or in the brush, which would reach the uranium and transform it into a radioactive substance, polluting the atmosphere of the capital irretrievably.

This danger of fire is not limited to the innocent [?], but also to the end of June. Immediately behind this radioactive material is an IEA ceramics plant, which keeps a supply of fuel oil. In case of an explosion resulting from fire, it would transform the uranium kept nearby into the air.

The walls of this improvised atomic material warehouse were pierced by a 50-caliber machinegun bullet. The night watchmen guard this uranium, which has been here 6 years without being guarded by military policemen, who in addition to this building guard the entire institute. The lack of more research by the IEA, the low consumption of uranium, left the atomic material unprotected and even the Institute of Weights and Measures, which controls the volume of uranium, has not shown up for months.

These irregularities have already been detected by the International Atomic Energy Agency (AIEA) an agency which set standards for safety when it visited the IEA 2 years ago during an inspection. At that time Pieroni promised to take the steps, which he has not subsequently.



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Another serious irregularity is the radioactive waste at the site of the Chemical Energy Center, which violates standards for any nuclear installation in the world. The instructions require a bulldozer of the Prefecture to dig the trenches, and to remove the materials contaminated with radioactivity there, materials which are contaminating the water tables.

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## BRIEFS

TMI ACCIDENT REPORT--Rio de Janeiro--"The Brazilian ex-  
the United States to study the accident that occurred  
Island nuclear reactor have returned and are preparing  
lished soon," the executive director of the National N  
mission, Rex Nazare Alves, announced yesterday. Meanw  
American section of the American Nuclear Society held  
classified "of a technical nature," analyzing in detail  
clear-plant accident. The main speaker was engineer D  
[Furnas Power Companies Inc.] did not report anything  
spite existence of a public commitment by the sector's  
thoroughly explain the accident's causes. Beyond that  
mitment to the International Atomic Energy Association  
through a letter in which Itamarati [Brazilian Foreign  
"an examination of the problem of nuclear-reactor secu  
energy may be used in an increasingly safer and more ef  
benefit of mankind." [Excerpt] [Sao Paulo FOLHA DE S  
guesse 1 Jun 79 p 6] 8834

BILL LIMITING GOVERNMENT CONTROL--With the signatures o  
153 deputies, Deputy Airton Sandoval (MDB [Brazilian D  
SP [Sao Paulo]) submitted to the Chamber of Deputies y  
a constitutional amendment permitting the government to  
and decide upon executing projects related to nuclear  
prior approval by the National Congress through a two-  
members. Airton Sandoval said he believes the concern  
the risks incurred by indiscriminate use of atomic ene  
fied. [Text] [Sao Paulo O ESTADO DE SAO PAULO in Por  
8834

NUCLEAR WASTE AREA SITE--Rio de Janeiro--Mines and En  
Cals stated here today that the storage facilities for  
waste from the Angra Dos Reis nuclear plant will be bu  
chosen by representatives of the people, especially in  
Fluminense district. He made clear that at no time ha  
erence for any location, and reiterated that the nucle  
completely harmless. [Text] [Brasilia Domestic Serv  
2200 GMT 29 May 79 PY]

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## BRIEFS

NUCLEAR STUDIES--Concepcion, Chile--The Chilean Nuclear Commission is studying the possibility of installing a 600-megawatt reactor to supply about half the country with electricity, a statement made by the executive secretary of the commission. He said that the project, if completed, would require an investment of \$1,000 million, with each kilowatt costing about \$1,000 to \$1,500. [LA RAZON in Spanish 28 May 79 p 3 PY]

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to \$800  
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## BRIEFS

NUCLEAR-FUELED ELECTRIC POWER--Mexico is one of only three that will produce electric power based on a nuclear potential. By 1982 it will be able to produce 1,300 megawatts with the potential of increasing this amount to 2,800 megawatts in the near future, said Vizcaino director of Mexican Uranium. He said that exploitation of the uranium resources within our nuclear development will be possible thanks to an agreement signed with France for a program for Mexicans specializing in geology, mining, metallurgy and atomic fuels. Vizcaino said that by 1982 Mexico will have two reactors with a 650-megawatt generating capacity each in operation. This will surpass Argentina's present production, which is 1,000 megawatts. [Text] [Mexico City International Service in 25 May 79 PA]

CSO: 5100

## NATIONAL NUCLEAR ENERGY PROGRAM EXAMINED

Energy Director Interviewed

Montevideo EL DIA in Spanish 4 May 79 p 9

[Interview with Manuel Berger]

[Text] Engineer Manuel Berger, a Uruguayan 46 years director of energy and president of the National Atomic Energy Commission. Asked by EL DIA about the process of incorporating or called "nuclear age," his response was as follows.

[Answer] Uruguay ventured into nuclear technology by means of a decree, it transferred the National Atomic Energy Office. The priority areas were nuclear medicine, radioisotopes and uranium prospecting, as well as a program of food irradiation. Beginning in 1976, the government decided the direction of the use of atomic energy as an energy source. By means of a decree, it transferred the National Atomic Energy Office to the Ministry of Industry and Energy, under the special Energy Office.

[Question] What is the current picture in our country?

[Answer] On the one hand, the existing programs are with the addition of veterinary research, which will be "the great task" of preparing to generate electrical energy in the event that the corresponding studies so dictate. For this period our country will have to increase its equipment. The greater demand in the industrial sector of development, will contribute in large part. It is precisely in the future that diverse forms of energy will be used, but without a doubt, electrical energy will play the leading role.

### Future Planning

Where planning is concerned, we will first of all examine the situation in the country: Uruguay basically consumes electrical energy.



using coal, firewood, solar and wind energy to a lesser extent. Hydrocarbons are 100 percent imported. Up to 1978, electricity was produced approximately half on the basis of imported oil and our own hydraulic energy. An effort is being made to increase to the maximum with the Salto Grande and Palmar plants. These will triple the current power of the interconnected network. The balance of our water system can provide us with some 10 percent. Of percentage it will not be very important in terms of energy that we will have.

In 1977 and 1978 studies with a view to estimating the energy needs at the end of the century were undertaken. The results coincide in showing that toward the first half of the 21st century the generating "park" will have to be increased. In view of the limited template the choices our country has for the building of new power plants, since there are no remaining hydraulic resources, there will be restrictions on the world level in the hydrocarbons market where solar and wind sources of energy are concerned, which will not serve in the next quarter of a century to provide the energy needed. This is asserted even by the officials in the energy sector of other countries which are allocating sizable budgets to research on alternative sources. For these and other reasons, the only alternative for future planning is nuclear energy.

#### Nuclear Electric Planning

There are two possible paths to be followed for obtaining electricity. The power a nuclear plant requires. The first would be to use, acquiring technology parallel to the building of a plant. The second would be to acquire this technology through prior training of personnel. The National Atomic Energy Commission is following the second solution, taking into account the somewhat unsatisfactory experience of the countries which have adopted the first.

[Question] And how is this plan implemented?

[Answer] The plan requires three concomitant activities: first, one from the other. First, a reactor research plan followed by secondly a radiation and nuclear safety program, equal in importance and thirdly, a program of assessment of our own uranium resources.

[Question] What is being done currently?

[Answer] With regard to the reactor research program, progress has been obtained, and this year a feasibility study on a reactor more advanced than the first, will be made, and it will serve for training of technicians, the production of our own radioisotopes, etc.

and nuclear safety program, the installation of a d  
trained abroad is being completed. The necessary e  
from the Atomic Energy Agency, and in part from the  
Commission in Argentina. In the coming months dosim  
equipment will continue to arrive, as will OIEA [Int  
Organization] experts for the installation and the  
personnel.

As to uranium, aerial and land prospecting activities  
were intensified in 1977 and 1978.

To summarize, the government has shown that it is in  
in the energy sector. From what I have seen, I have  
year the decisions in the energy sector which will  
safety within the next 20 years will be adopted.

#### CIN History

Montevideo EL DIA in Spanish 4 May 79 p 9

[Text] The Nuclear Research Center (CIN) in our co  
Street in the building originally for the use of the  
University City. The director of the center, engine  
kindly provided us with a detailed report of the ac  
the institute. Also he explained at the outset tha  
adapting our country for the use of various forms o  
CIN is creating the facilities required. And so, a  
of an agreement, the plans for the establishment, i  
of the center were entrusted to the University of t

#### Duties of the CIN

The body has three responsibilities: teaching, res  
that it can pursue these three lines of activity, l  
built in accordance with nuclear and radiological s  
and constructed. These laboratories have special f  
of radioactive waste, adequate ventilation and air  
various types of equipment making it possible to pu  
With reference to this last point, there is also a  
in farm applications, carried out through an agreem  
Veterinary Medicine. The agreement seeks, for exam  
the achievement of better knowledge of the processes  
and cooperation with the Faculty of Agronomy has al  
view to a better use of fertilizers.

There are also other programs pertaining to the pre  
sterilization of medical equipment, production of r  
uses, and the planning of the radiopharmacological  
nuclear medicine.

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Recently the CIN installed a nuclear reactor which is c  
basically teaching purposes. It is the first reactor o  
and it was put into operation in the course of the mont  
According to engineer Hector J. Mujica, this developmen  
landmark in the advance of scientific training on the n

"The reactor is of a type allowing production of a fis  
reaction under such conditions that it can be controlle  
ized to produce energy for various experiments," Mujica  
CIN nuclear reactor will lead to the proper training of  
who will in a short time have responsibility for the in  
ment of greater power, within the medium-range plans pe  
introduction of nuclear electric energy in our country.  
the nuclear plant requires a very high level of technic

For these reasons, one of the most important programs o  
velopment of a work group made up of highly skilled tec  
which will make up the nucleus required for advising, f  
decisions to be mad for the installation of a nuclear  
comes.

It should be noted that the center offers a basic cours  
methodology within the University of the Republic progr  
purposes, training the technicians in various fields wh  
of these radioactive elements.

This then is how the basic personnel for the developmen  
programs is being trained at the CIN.

#### Center Facilities, Goals

Montevideo LA MANANA in Spanish 3 May 79 p 6

[Text] The use of nuclear energy for peaceful purposes  
the Malvin Norte Nuclear Research Center in our country  
is being used there for the training of advanced studen  
things.

The research group began its efforts in 1968, when an a  
between the University of the Republic and the National  
mission.

In 1974, the university authorities appointed new admin  
technical personnel which, after training in the United  
Argentina, began to work to put the modern plant in ope

The various research plans have been aided by the commi  
(thermal) reactor designed for research, teaching and t  
radioisotopes. All of this work is controlled and supe  
personnel where radiation safety is concerned.

The operations of the various research and production as radiation and nuclear safety, nuclear electronics are accomodated on four floors.

At the center, programs of research for industry, hy veterinary medicine, agronomy, the use of ionizing r

#### Hot Cell

One of the programs is pursued in a "hot cell," where chemical element called molybdenum 99m, the technet medicine for diagnosis and supplied to the market can

Currently, a second multi-purpose hot cell is being generators of technitium 99m, iodine 131 and/or mole various purposes.

A reactor with a control room located 3.60 [meters] a tank containing the nuclear core is located in the s building. This Lockheed reactor uses light water as enriched 20 percent into uranium 235 as a fuel, dist with 11 aluminum sheaths each.

The reactor has two neutron tubes for radiation and the production of ultrashort-cycle elements.

#### Radiation Chamber

One program includes tasks oriented toward the insta and maintenance of the electronic equipment at the c

This group has studied and carried out a series of m reactor intervention system as a part of the research of technology.

There is also a gamma cell-type radiation chamber in by the International Atomic Energy Organization, per preservation of foodstuffs, sterilization of medical industrial applications.

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## BRIEFS

USSR EQUIPMENT FOR CEMA STATIONS--The Soviet Union equipment for atomic power stations which is to meet the needs of members of CEMA. The fact was disclosed by Deputy Ovchinnikov. The plant is going up in the city of south of the country's European part. Speaking in Moscow, Ovchinnikov reported that Soviet shipments abroad include 4 which are the cheapest, most reliable, and simplest of the time. They also generate energy at lowest cost. equip atomic powerplants in the GDR, Bulgaria, Czech Republic, [Text] [Moscow World Service in English 2100 GMT 26 May 79 LD]

YUGO NUCLEAR SEPARATORS TO USSR--Ploce--Two separator plants were shipped from Ploce today to the Soviet Union. 24 separators, each 32 meters long, weighing 282 tons, for 1,000-megawatt powerplants, are being produced for the Energoinvest factory in Sarajevo. [Belgrade TA in Serbo-Croatian 0932 GMT 26 May 79 LD]

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## NUCLEAR PROGRAM DISCUSSED BY CSSR NUCLEAR ENGINEER

Bratislava PRAVDA in Slovak 23 May 79 p 3 AU

[Article by Eng Jan Neumann, candidate of sciences, chairman of the Czechoslovak Atomic Energy Commission: "The Peaceful Use of Nuclear Energy in Czechoslovakia"]

[Excerpts] Our Share in the Development of the Nuclear Program

Czechoslovakia is participating in the nuclear energy program of the world in those spheres for which it has prerequisites in terms of material. This applies particularly to the extraction and to the processing of uranium (so-called yellow cake) which we are delivering to the West for further processing; the production of selected components of the primary circuits of electric power stations equipped with VVER-440 reactors; the construction of nuclear power stations with VVER-440 reactors on Czechoslovak territory; research and development of selected components for the next generation of power stations and of their fuel cycle; the neutralization--that is, fixation and safe storage--of radioactive waste; research into the safety of nuclear power stations and into their influence on environment; control in the production of components and in the construction and operation of nuclear power stations; the physical protection of nuclear power stations; the transport of nuclear fuels; and to the training of qualified personnel in these mentioned spheres.

### The Present and the Prospects

The state and the program of constructing nuclear power stations in Czechoslovakia can be summed up as follows: Nuclear power stations in Jaslovské Bohunice and in Dukovany in south Moravia are now being built in Czechoslovakia with assistance on the basis of intergovernmental agreements between the Czechoslovak Republic and the Soviet Union. Both power stations will be equipped with four blocs of the VVER-440. Both electric power stations are to be put into operation gradually. The installed output of nuclear power stations is to reach 3,520 megawatts.

The construction of additional nuclear power stations--in west Slovakia and north Moravia--is now in a state of preparation. The selection of sites is determined by the needed distribution of electric outputs with regard to the needs of other regions are, for the time being, covered by conventional electric plants and by electricity supplies from the Soviet Union. The new power stations will be equipped with reactors of the VVER-440 and VVER-1000.

AKIA

It is important for Czechoslovakia and for the other CEMA countries that nuclear power stations should not only insure the production of electricity but also the production in the form of steam and hot water for industry. This is why it is envisaged that all nuclear power stations now being built will supply, with the aid of heat exchangers, towns in the vicinity with heating for apartments. The Czechoslovak "Energoatomprojekt" and the Soviet "Atomenergoproekt" are cooperating on a type-model of a nuclear power station. This type-model project is to be concluded this year; the decision on its realization should be made by next year.

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## OPERATION OF BOHUNICE NUCLEAR POWER STATION DESCRIBED

Bratislava ZIVOT in Slovak No 20, 10 May 79 pp 2-6

[Article by Stefan Joza: "A Volcano Beneath Us"]

[Text] How convenient it is to turn a knob, push a button and have a light go on, a television come to life, or a microwave oven, a washer, a vacuum cleaner, a trolley, an electric train, an entire plant go into action at this command. This is so simple that even a small child who has no comprehension of what electricity is producing electricity is no great problem (you could attach a dynamo to a bicycle and light a light), but to produce the huge amount of electricity that mankind needs every day is indeed a problem, and a very difficult one which quite a few scientists, economists and politicians are struggling with.

The supplies of traditional natural energy such as coal, oil, gas, water power are now almost fully utilized, while the demand for electric power is increasing at a dizzying rate. Man has mastered nature and in turn has enmeshed himself. Thus there has arisen a dilemma, so that neither can exist without the other. The world faces a dilemma: where to go now, and where in 10 or 20 decades ago there were already 3 billion of us, and now there are 4 billion. How many of us will there be in 20 years? How to get enough electric power for so many people to live by, to have work and bread?

Wind-powered generators are of no use: they work, but just as the wind. Solar generators are extremely expensive and only work on sunny days. We have no ocean tides--so what to do? How can we produce electricity, the basis of civilized man's existence?

What remains is nuclear power stations.

In many states, however, a wave of protests has arisen against the use of atomic nucleus for production of electrical energy, on the grounds that nuclear power stations are unsafe and mankind is threatened with nuclear war, since the problem of nuclear waste disposal has not

Superficially, these tests do not seem more intense  
equipment armed with nuclear weapons. Unfortunately,  
points in these demonstrations can tell mankind where else  
for the production of electricity.

Then, like it or not, our state has had to lay this  
the construction of nuclear power stations as an indispen-  
the further development of socialist society. By the e-  
year plan, our nuclear power stations will already have  
tributed to the power grid.

#### Control Activity

At 11:15 by some war universal activity in the block control  
nuclear power station in Jaskovské Podhradie. Everything  
going on if the military was under way. This was also  
the "people's work" of the control room. While under  
it was a great people here. There were now more than 20  
colored lights blinked on and off on consoles, bells and  
was ringing, and the ringing of telephones, and crisp  
atmospheric disturbances in a radio broadcast. Mixed in  
people were human voices, speaking Slovak and Russian.

"You have a remarkable instinct for coming at the very  
right to grasp her," said production chief Engineer Ja-  
gooding. "We've just finished the most important test,  
but the first block is still operations." But his tone  
of emphasis, but instead one of pleasure that after some  
work, stress and strain the undertaking was at last over.  
A feeling that at last, perhaps, only by a runner as  
a mountain climber as he stands on the top of a towering  
then people who have pursued some goal and are attainin-

The block control room is the brain of the power station  
facility as a whole contains more than 1,000 control ele-  
ments, points, and it is here that the most important of  
all is to be correct that is still this an observation  
attention to observation, the whole operation of the nuc-  
controlled from here. From here there have been control  
line start, which was the 1st shift's Karanah.

Four persons from each shift have the critical jobs:

1. the reactor operator,
2. the auxiliary circuit operator,
3. the electrical distribution system (operator),
4. the block chief.

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## A Time of Stress

Engineer Stefan Misik, the reactor operator, stood before the panel intently watching all the instruments. Sometimes his hand pressed the control switch when the automatic control system seemed to be reacting. His tension was the greater as the first turbine picked up steam from the steam generator, which in turn depended

Shift engineer Jan Onuska drew my attention to the panel opposite. The needle was climbing steadily on a meter. It was being watched intently by electrical system operator Jan Fatik. His hand was on the control switch. Now! The needle reached the proper position, the operator turned the switch and at that moment a whole chain of white line segments lit up

"Okay," said the shift engineer, who during his shift is the responsible person for the entire power station, of everything and everyone in it. The responsibility, including legal responsibility, is on his shoulders when the first turbogenerator is phased into the system," he reported.

The reactor operator ran his eyes along the instruments. "He had to show what it could do. The first generator was running and the reactor showed an output of 220 million watts. Now the second turbogenerator. This required more steam, an increase in flux, an intensification of the reaction.

At that moment, somewhere three stories below us, behind a concrete wall enclosed by a powerful steel housing, invisible but frighteningly hot, the water was in operation. The water temperature was at almost 300 degrees Celsius. The pressure was rising to 12.25 MPa, or 125 kgf [kilogram force] per square centimeter of the housing. Slowly and invisibly, but under the "keen" observation of the instruments, cells containing the fuel rods [kazyty a uranowy prutmi] alternately rose and fell.

## What Does the Operator Think About?

I would have liked to enter into the thought processes of the reactor operator--to know what he was thinking at that moment, what was in his mind, in the awareness of such a responsibility.

"Not me," the shift engineer dissuaded me. "I'll tell you what he's thinking."

"What does he's thinking about?"

He said it well of him.

"It's extremely demanding work. At such times the operator is in a state of high tension," said our guide, Engineer Marian Janiak, coming to the reactor. "I have learned to know about this. We underwent special pre-

anyone who can't stand such psychic stress can't be an operator. A huge immense value is entrusted to the operator: it's not that it can be borne lightly, as you can imagine."

This is true. When the cash box is brought out to pay wages, it is guarded by an armed guard, because the responsibility is so great. But each of these persons is in charge of billions of rubles.

Jan Jark was again looking intently at the climbing needle. He turned the switch and other horizontal dashed line generator number 2 was phased into the network.

Now attention was again directed to the reactor's measuring instruments. Everything was correctly balanced: the reactor output agreed with the two turbogenerators.

Production chief Engineer Josef Bodul smiled quietly. The tension had disappeared somewhere, and people's faces relaxed. He stood for a while. At a table sat the men who had the responsibility for the startup of the first block of the V-1 station: Engineers J. Bodul and A. Krstenik, and Soviet experts V. Gulyaev. They signed the order for the next 24 hours:

**They Stripped Us Naked**

The number of people in the control room decreased, and the work began.

We too were leaving, proceeding with Engineer M. Nanyan to the "Controlled Area". We were going to facilities to which only a few people have access. Our guide promised us that we would see the reactor itself in operation from close up. But this is not so simple. First we had to present our special permissions. There was a large locker room full of numbered metal lockers. There were two pairs of lockers with the same numbers. One was for "clean" personal clothing, while the other was for "dirty" official work clothes. Men wearing new white shirts, trousers with red stripes, gloves were just coming out of the facility. Both steps resembled X-ray apparatus. They passed on one wall and then on the other. The instruments showed no radioactive contamination. The locker room was released. If there had been a single drop of contamination, we would have had to go back, undress and shower, then come back and start over. The locker room operators are inexorable on this point.

We too received the new white outfit: shirts, trousers, socks. On our backs was the inscription "V-1" in large red letters. After presenting another permission, we were equipped with a Geiger counter. A photographer was most concerned that radiation might ruin his film.

"You needn't have any fear," Naniass assured us.

"And why did we have to put on this getup?" I wondered, at which Naniass silently indicated that his socks were at least two sizes too small.

"We couldn't have come down otherwise," was the uncompromising answer.

#### In an Underground Observation Post

The dosimeters are small boxes which are fastened to a loop which we have pockets. This clothing has neither pockets nor buttons, but is fastened with loops. The boxes contain sensitive material which will record even the slightest dose of radioactivity. Thus equipped, we went and passed through armored doors from 10 to 20 centimeters thick and went along underground corridors and through tubes. Our guide turned a valve and opened it. Water rushed out onto the ground.

"If the floor was contaminated, this would wash it away quickly," he said. "Everything is secured here," he continued. "Notice that green light is burning everywhere. If radioactivity were recorded, the light would turn red."

We went through more doors. The place was full of measuring instruments. Here, the decontamination of radioactive water from the primary circuit is being monitored. In simple terms, all water that goes into the primary circuit is sent again. Primary circuit foreman Eduard Ruzicka, who is the head of the Basic Organization No 4, KSS, in the production section, was waiting for us.

"Can you leave here, say for a meeting?" I asked him. "That's a question," he answered. "When we have a committee or party meeting, we have to trade shifts with someone. That's the only way we do it here."

Engineer Naniass received some keys from him. Then he led us through the corridors which he opened, going in and turning on the light.

#### The Silver Room

The scene which greeted us would not be easy to forget. There were large pumps, from which ran heavily insulated pipes painted silver. Other pipes, and tanks as well, were of a silvery color. It was a fabulous room of silver, in which there was however no activity. The room would have been dark if our guide had not turned on the light. The whole pump was in operation.

"That's much better than if they were working," remarked Naniass. "It is for filling the reactor with boric acid. If a pipe cracks, there was a coolant leak, the pumps would start up automatically and add coolant."



Boric acid is the guardian of the reactor and of safety. reaction and render harmful radiation harmless. If there is a leak of radioactivity, a shower of boric acid would be directed at the reactor.

A clever device is located in a shaft through which the cooling system pass. We have already noted that there are many measuring points in this power station. The 1,440 most important are monitored and evaluated every 8 seconds by a computer. These are very important data. If the cables from these points catch fire, the power station would have to stop instantly. They are protected: if the temperature rises above the permitted limit, the shaft is automatically filled with fire extinguishing foam.

#### In the Reactor Room

We stopped before large, heavy armored doors. Engineer Nannas asked us a bit to open them. They undoubtedly weighed a couple of tons.

"Look, there is the reactor," he said, pointing to a yellow structure that looked like a pagoda (or so it seemed to me, at least, at the time).

We went in. Inside were two men dressed the same as we were. They were not surprised that we had come; no one needed special authorization. What would he be doing here?

The reactor dome completely fascinated me. Not only by its size, but also because of my awareness that tremendous forces raged in the two turbogenerators with an output of 220 megawatts each. The reaction, right under our feet.

My colleague was eager to climb up the narrow curved steps to the reactor room and there to take such pictures as had never been taken before, even though ten thousand of his pictures had been published. He was allowed to do so. Soon he was high above our heads.

Engineer Nannas invited me to come nearer to the reactor. To get a closer view, he began to climb up a ladder to the top of the cooling tower. Behind him, not knowing what to do with my notebook which I held in my gloved hand. Hold it in my teeth? Perhaps that would work. My back was to the camera; otherwise I could not have taken the photograph which, to the delight of the editors, would have shown me at the reactor with my notebook.

I expected that the reactor would vibrate and hum, that it would be boiling inside it, or that at least it would give off heat. But it felt as still as a sleeping baby. It did not vibrate, it gave off no heat. I had the unpleasant suspicion that I had taken me to the inoperative reactor of the second block.

Engineer Nanias smiled:

"Even if that were the case, unfortunately the other reactor. There is only an empty hole. But this one is really working it."

By the end of the year, the second block of the V-1, which is a duplicate of the first one, is to be in operation. The tracks will lead to the other part of the reactor building, which is still under construction.

#### How They Dispose of the Uranium

Far below us is a pit 17 meters deep whose sides are lined with steel. This is the pool in which spent uranium rods will be placed as a special solution.

The reactor is loaded with 42 tons of uranium in the form of fuel rods. After the first year of continuous operation, it will be necessary to replace a third of them, another third in the second year, and the third in the third. Thus every three years the fuel has to be exchanged. But what about radioactive wastes? The storage in the waste basin is only a temporary measure, a compromise, so that the power station can operate safely. Active waste will not endanger anyone. But scientists have not yet found a solution to this worldwide problem of what to do with it. Recall the early history of petroleum extraction. It was extracted from the ground, distilled to produce kerosene. At that time, no one knew what to do with the gasoline, which was the most useless waste product. When it was poured on the ground, the ground began to burn, and when it was poured on the sea, the sea caught fire. And what is gasoline today? Kerosene is almost forgotten, except for serving as jet fuel.

#### It Can't Happen!

And indeed there is a use for spent uranium rods, but not for the waste which mankind has an interest in: for the production of atomic energy. Plutonium can be produced from spent uranium, and plutonium is the main ingredient in atomic bombs.

"Notive that box," said our guide, pointing to one corner of the room. "That is a camera which checks to see that nobody handles the rods."

The camera is under the supervision of the International Atomic Energy Agency, located in Vienna, which exercises supreme oversight over every nuclear station in the world in order to prevent unsupervised accumulation of strategically important material. If any such thing happens, it will trigger an alarm in the United Nations.

The number of nuclear power stations in the world is increasing. The Skoda works in Plzen is specializing in the production of re-

the Voronezh type, like that used in the V-1, for all power stations are in operation in the United States, Canada, the United Kingdom, Bulgaria and elsewhere. It is not as if we did not put off their development; otherwise we would not have obtained enough electrical energy for our population and the current development of our productive forces.

Let us draw only this small conclusion:

It Is Worth Something!

Our V-1 station is currently producing "only" 440 MW. To produce this would require about 500 carloads of coal a day. When the station started up, there will be an additional 440 MW. This would require another 500 carloads. But we are currently putting up an identical station at Bohunice. Would anyone be able to deliver and handle this coal a day? Certainly not, even if Jaslovske Bohunice were on top of a coal deposit. This is worth thinking about.

The question of safety?

This power station is not an adventure, but a well-tested, reliable security, in which each worker is under close supervision of experienced operators, who are truly uncompromising.

When we had arrived at the first control point, their cameras were turned on us. Ultimately we had to let our camera be checked as well. We were searched when we passed through the health checkpoint. We were searched every nook and cranny and had been in places where only specialists could go, as well as climbing on the nuclear reactor while it was in operation. Nonetheless we were passed through the checkpoint as "normal."

When we were again dressed in our own clothes, my colleague made the following statement:

"It was tremendous, an experience that would scarcely be imaginable. Even if you could fly high above the clouds in a space ship, it would not be such a utopia as this."

#### PHOTO CAPTIONS

1. p. 3. Reactor operator Jozef Misik's intentness in his work. Thousands of buttons, lights, switches, means of control. Now is the critical moment: the reactor must be kept at a constant temperature.
2. p. 3. The nuclear reactor. It extends about 4 meters above ground and another 8 below ground. Let no one be misled by its appearance: "back": for it is in operation. Nonetheless, it is safe from it in ordinary comings and goings.

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3. p. 3. Thousands of switches and colored lights. All of significance for the control of the nuclear power is these elements leads to complex process equipment room is the nerve center from which the nuclear thing dependent on it is controlled.
4. p. 4. The "loading equipment" for replacement of fuel reactor.
5. p. 4. Edward Ruzicka is the foreman of his shift. In chairman of the KES No 4 basic organization, who the production section.
6. p. 4. A while ago these four had a good deal on their have begun to relax. Everything is operating and and they have reason to smile. From left: Eng Eng Josef Hrdul, leading Soviet specialists for power stations V. P. Lapskiy and A. T. Gutsalov.
7. p. 5. Our guide, Eng Marian Nantas, shows us the control moving the control rods.
8. p. 5. Corridors like this pass through the underground station.
9. p. 5. Anyone who leaves the active zone must pass through to be checked for contamination by radioactive.
10. p. 6. This location, in which no one works, gives the room of silence. But only an order from the automatic equipment is required to put the equipment into.
11. p. 6. As can be seen from the picture, the engine room facility. It was reduced by companies in this.
12. p. 6. Even our photograph's camera had to be checked

94-7  
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## BRIEFS

ATOMIC POWERPLANT CONSTRUCTION--PAP, Warsaw, 28 May 79. Construction of Poland's first atomic power station will begin in the vicinity of Lake Zarnowieckie. The power station is being designed by the elektroporoyekt Institute in the Soviet Union. CH says that the power station will have two VVER-440 reactors, each of 440 megawatts. A large pumped-storage power station is also being built in the vicinity. It will take advantage of the water levels of two neighbouring lakes. It will operate 24 hours. Outside the peak period the pumped storage power station, independent from the atomic station, will pump water to the reservoir. The technical-economic part of the atomic power station project. The complete design will be given to Poland toward the end of the year. The Soviet designing institute is in close cooperation with the Polish. The Leningrad bureau is designing the main unit. The power station will have a magazine and an auxiliary power station with diesel engines. [sentence as received] Polish designers are nearing completion of the auxiliary subunits of the power station, including the turbine. [Text] [Warsaw PAP in English 1312 GMT 28 May 79]

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#### BRIEFS

ALEXANDRIA NUCLEAR PLANT--The first nuclear power plant  
shortly be established at Sidi Krayr in Alexandria.  
generate 600,000 KWH, an official source said. The  
met yesterday under Mr. Mustafa Kamal Sabri, Minister  
Energy, to discuss a special report establishing more  
in other sites. [Text] [Cairo THE EGYPTIAN GAZETTE  
p 2]

CSO: 4820

## COUNCIL OF MINISTERS TO REVIEW ATOMIC CENTER PROJECT

Jidda ARAB NEWS in English 23 May 79 p 2

[Text]

JEDDAH, May 22 — A report on the proposed Saudi atomic energy center will be submitted to the Council of Ministers in the near future but preliminary indications suggest that it will be one of the largest in the world, "Al-Riyadh" reported Tuesday.

The center, which is expected to study the construction of nuclear reactors and conceivably a nuclear fuel processing, was proposed by the Ministry of Petroleum and Mineral Resources as part of a program to relieve dependence on hydrocarbons as the Kingdom's single source of energy.

The council is expected to form a ministerial committee to study the oil ministry report, the paper said. If approved, the project will be the responsibility of the new National Center for Science and Technology (SANCST).

Commenting on the project, a senior official told the paper that the proposal was a sign of the advanced state of scientific development in the country and the desire to diversify Saudi sources of energy.

Quoting official sources, the paper said that the proposed center will be one of the largest ever built and will import talented staff from abroad. Its role will, however, be subordinated to Saudi development purposes and Saudi environmental requirements.

The government announced plans for the project at a meeting on April 3 of the Supreme Council for Administration Reform, chaired by Defense Minister Prince Sultan.

Described as the first step toward the creation of a nuclear industry in the Kingdom, the center was scheduled to examine the possibility of building reactors on the Red Sea and Gulf coast and would also work toward establishment of a Saudi institute for reactor technology and a fuel processing plant.



BIA

## ZAMBIA

### JAPANESE DELEGATION NEGOTIATING URANIUM EXPLORATION

Lusaka TIMES OF ZAMBIA in English 24 May 79 p 1

[Text] **ALTHOUGH** Zambia is a store-house of minerals and natural resources, she lacks manpower and financial resources to undertake new mining ventures. Mines Minister, Mr Mufaya Mumbuna, said in Lusaka yesterday.

Welcoming a delegation from the Power Reactor and Nuclear Fuel Development Corporation (PNC) in Japan, which has come to negotiate for prospecting, exploration and mining of uranium in Zambia, Mr Mumbuna said mining technology was not new to Zambia.

He said what Zambia lacked in finance and manpower was amply compensated for by her keen desire to extend the hand of co-operation to the willing and

competent partner to develop her potential resources to the mutual benefit.

Mr Mumbuna said Japan, one of the leading industrialised nations in the world, had the manpower and finance.

Like all developed and industrialised countries, Japan was in need of energy and raw materials. The compatibility between her and Zambia had the required ingredients for a successful joint ventures, the minister added.

Negotiations start today, and Mr Mumbuna emphasised that for the talks to succeed it was important that Zambia was assured of just and equitable proportion of the proceeds derived from the uranium mined from her soil.

## ZAMBIA

### BRIEFS

MINERAL AGREEMENT WITH JAPAN--It was announced in Lusaka yesterday, 4 June, that negotiations between Zambia and Japan on the exploitation of uranium deposits in the southern province have reached an advance stage. The two countries reached a memorandum of understanding after negotiations on agreement in Lusaka for more than a week. Zambia was represented by the Prescribed Minerals and Materials Commission and Japan by the Power Reactor and Nuclear Development Corporation. A statement issued by the two sides said negotiations had been held in a cordial atmosphere and substantial progress towards an agreement had been achieved. The Memorandum of Understanding will be signed by leader of the Zambian delegation and permanent secretary in the Ministry of Mines, Mr Leonard Chinjavata, and director of the corporation, Mr (Mitsoa Saito). [Lusaka Domestic Service in English 0500 GMT 5 Jun 79 LD/CA]

CSO: 5100

## BELGIUM

### PRESSURE ON BELGIUM TO DEPLOY LONG-RANGE NUCLEAR MISSILES

Brussels POURQUOI PAS? in French 17 May 79 pp 44-47

[Article by Jacques Dujardin and Jacques Wiame: "Belgium, an Atomic Target"]

[Text] While the recent SALT 2 agreement between the two superpowers is being heralded with a great hullabaloo, scarce attention is being paid to plans for "modernizing" so-called "theater nuclear weapons in Europe." Nobody in our country has as yet talked about these plans even though they will very shortly constitute a new ticklish military issue for the Martens government to resolve. In the face of the threat posed by the already deployed Russian SS-20 missiles, Belgium is being strongly urged to accept installation of long-range nuclear missiles on its territory, rockets capable of striking the "Soviet sanctuary." This is an important decision--nuclear weapons currently deployed in Europe can barely reach much farther than the Vistula--which is liable to make our territory a priority target for Soviet missiles launched from the Ukraine.

This issue is even more explosive than the neutron bomb issue. It is the subject of sharp debate within NATO, a debate fraught with consequences for Belgium, financial consequences in particular. But in our country there is no mention whatever of this issue. Not even among members of those parliamentary committees specifically responsible for such matters. With the exception of a very few insiders, nobody is aware, up to now, of this major political choice.

The news almost passed unnoticed: late last month, defense ministers of the eight member countries of the NATO Nuclear Planning met at Homestead Air Force Base in Florida and made a decision of capital importance. They agreed to "reinforcement" of "theater nuclear weapons" in Europe by introducing, inter alia, Pershing 2 long-range missiles, cruise missiles, and even an entirely new long-range theater nuclear missile. Is this merely a "modernization" effort, as NATO communiques claim? Definitely not: at the present time, delivery vehicles for the some 7,000 nuclear warheads or bombs stored in Europe cannot carry their lethal payload any farther than the Vistula. The new delivery vehicles that would be deployed could, however, strike deeper at targets inside the Soviet "sanctuary." Consequently, what is actually involved is a change in the nature of the arsenal available to European NATO member

would be replaced with weapons capable of striking the enemy in his own territory.\*

### SS-20 Threat

But why change weapons? Because as NATO strategists explain, the Soviet threat has grown to an unusual degree. In fact, the USSR recently deployed some 100 SS-20 missiles in the Ukraine. The SS-20 has a range of about 4,500 kilometers and each missile is armed with three low-yield but deadly accurate independent reentry warheads. In addition, these delivery vehicles are mobile and thus very difficult to destroy. Their range covers Western Europe and the Mediterranean. According to General Pierre Gallois, a French military expert, these 300 nuclear warheads "can destroy the whole NATO defense system in 10 minutes." Atlantic experts confirm that with the SS-20 missiles, in addition to the Backfire supersonic bomber and also the SS-21 missiles--short-range (150 kilometers) but with a 25-kiloton warhead--the Soviet Union has overwhelming firepower for which there is no equivalent in West European countries. Does this mean the nature of the threat posed by the Kremlin has changed? Some Western military officials do not think it does: after all, these tactical weapons are replacing others such as the less maneuverable, less "flexible," and shorter-range SS-4's and SS-5's aimed at the same targets. Nevertheless, their accuracy, their number and firepower are such that these nuclear delivery vehicles do seriously unbalance the ratio of forces within the European theater. NATO's essential problem is to find a response to this challenge. This challenge is especially alarming in that it lies within the "grey area" deliberately side-stepped in the SALT 2 negotiations: after all, this question concerned Europe and not the balance of terror between the USA and the USSR.

### Prepared To Escalate

And this is where things become complicated. Atlantic officials are, in effect, attempting to perform a dual task. First, the Nuclear Planning Group is considering preliminary steps for the establishment of what is called "modernization" of theater nuclear weapons in Europe. Its final decision, including practical ways and means of implementation, is expected before the end of this year. And deployment of the new delivery vehicles would reportedly take place in 1983. Secondly, another group, the Special Group, composed of high-level experts was formed in April to study control problems related to this new type of armament and formulate theater nuclear arms limitations proposals for submission to the USSR: a "package" to be placed in the hopper for the future SALT 3 negotiations expected to begin in 1985. These proposals will reportedly also be in final form by the end of this year and put forth as a detente gesture by NATO. Should the Kremlin, at the time, respond with a "niet", then the European allies in NATO would be prepared to start escalating.

Yet these allies would still have to reach agreement among themselves to launch out into this terrifying and costly venture. Because the installation of long-range nuclear missiles in Europe carries with it the great risk of weakening the solidarity between the United States and Europe. Would the American ally still brandish its intercontinental missiles in defense of Antwerp or Rotterdam if New York City were not threatened by a conflict within the European theater? In NATO jargon this danger is known as "decoupling." As a matter of fact, in a crisis situation the White House might actually tell its European allies: "You now have the wherewithal to defend yourselves. It's your move." Europe would, therefore, find itself in the front line with its response capability consisting of missiles purchased from the United States who would retain, in principle, the right to control any use of these nuclear weapons, as is the case today.

#### Strong Pressures

We must frankly admit that European NATO members are by no means enthused over these prospects. Nobody likes to serve as a target. The Federal Republic of Germany, the country primarily affected by the "modernization" of nuclear forces, has already let it be known that it would not allow Pershing 2 missiles on its soil unless other NATO allies make a similar effort. Yet the Scandinavian countries--Norway and Denmark--refuse to allow any nuclear weapons on their territory, except in a period of crisis. The Netherlands is scarcely less reluctant: in a pinch, it would allow cruise missiles capable of being launched from ships off its coast. On the other hand, Great Britain could more readily accept cruise missiles. Shortly after taking up residence at 10 Downing Street, Margaret Thatcher took a position along these lines. As for France--not a member of the NATO military organization--it has reportedly proposed to West Germany that the two countries jointly produce European medium-range rockets and cruise missiles.

And what about Belgium? For the moment, it is being subjected to strong pressures. Defense Minister Vanden Boeynants must definitely know something about such pressures. This question was undoubtedly one of the most important items discussed in Brussels last Monday, Tuesday, and Wednesday at the meeting of Eurogroup members followed by the NATO defense ministers' meeting. Furthermore, Henri Simonet will no doubt have occasion to study this burning issue closely in preparation for the meeting of NATO foreign ministers in The Hague late this month. But what answer will the Belgium government finally give? There are several possible conceivable answers.

It can either agree to allow Belgian units to be equipped with long-range nuclear missiles;

Or allow American units armed with these missiles to be deployed on our territory;

Or, lastly, limit itself to financing a NATO program for deployment of this type of weaponry at sea. There is still, however, the problem of finding the necessary funds at a time when the national defense budget is in a "zero growth" condition.

But with regard to this "a la carte" choice of solutions, and with regard to even the very principle involved, does not a decision of this importance require public debate that would enable citizens to understand why their small country is liable to become a target for Soviet missile batteries? As far as we know, only a few insiders in Belgium are fully acquainted with the facts of the problem. Consequently it would greatly surprise us if members of the House defense committee had received the slightest briefing on this subject.

Who then will dare be the first to speak out?

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## FEDERAL REPUBLIC OF GERMANY

### BRIEFS

MODERNIZATION OF NUCLEAR WEAPONS--The Hague--Federal Foreign Minister Hans-Dietrich Genscher believes that the modernization of tactical nuclear weapons is politically and militarily unavoidable. He stressed today to the NATO spring conference, which is being held near The Hague, that the Soviet military threat has been qualitatively intensified by the SS-20 missiles and the Backfire bomber. Arms control talks with Moscow only have a chance if the ability of the Western alliance to act is quite apparent, Genscher said, alluding to internal political resistance against the modernization of NATO's own nuclear weapons which is making such a decision difficult in several European NATO states. Genscher underlined that the alliance could only successfully play its role of safeguarding peace if it defined its interests together. If individual NATO members believed that they had to primarily pursue their own interests, this could lead to a "disintegration" of the alliance. [Excerpt] [Hamburg DPA in German 1303 GMT 30 May 79 LD]

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## FRANCE

### BRIEFS

**BARRE ON POLICY**--Asked about nuclear policy, the prime minister denied that France has opted for nuclear energy to the exclusion of any other energy sources. It is a question of insuring, he stated, that nuclear energy will contribute toward our requirements in the coming years. Our aim is to insure that our oil consumption in 1985 amounts to 100 million tons (compared with our present consumption of 108 million tons) and that nuclear energy amounts to the equivalent of 43 million tons of oil. "In 1985 nuclear energy will cover 65 percent of our electricity requirements. This is a reasonable and necessary objective." [Excerpt] [Paris LE FIGARO in French 23 May 79 p 5 LD]

**LEAK AT NUCLEAR POWERPLANT**--A nuclear incident, rapidly brought under control, took place yesterday at 1500 in a reactor in the factory of Cadarache situated on the River Durance in the south, in the Bouches-du-Rhone Department. A slight leak was discovered in the cooling system of an experimental nuclear reactor, in a steam-generating tube. This is the same type of accident as that which occurred at the Harrisburg power station with one essential difference: The leak was much less serious and all the safety arrangements worked immediately. The reactor has been stopped and no one has been contaminated. We learned a short time ago that the temperature and the pressure were below normal. A small evaporation of radioactive gas occurred and entered the atmosphere when the leak took place but the level of radioactivity is very much below the norms permitted by the regulations. An investigation has been started. [Paris Domestic Service in French 1000 GMT 5 Jun 79 LD]

## NETHERLANDS

### GOVERNMENT WILL NOT MAKE CHANGES IN NUCLEAR POLICY

Rotterdam NRC HANDELSBLAD in Dutch 15 May 79 p 11

[Text] The Hague, 15 May --The accident at the nuclear reactor in Harrisburg (USA) does not give the Dutch Government cause to revise the policy for a possible expansion of the number of nuclear reactors. The government unequivocally stands by its statements made in the government's policy statement of 16 January 1978 in which the construction of three new nuclear reactors is made dependent upon an acceptable method to store the radioactive waste. Moreover, according to the government statement, a satisfactory solution must be found for the problems of the safety of nuclear reactors. After the accident at Harrisburg the nuclear reactors in Borssele and Dodewaard will not have to be shut.

That appears from a letter which Minister Albeda (social affairs) and his colleague Ginjaar (public health and environment) have sent to the Second Chamber as a result of the defect in the Harrisburg reactor. On the basis of a description of the course of events of the accident there, based on reports by the American commission of supervision on nuclear energy (the Nuclear Regulatory Commission -- NRC), the government members came to the conclusion that a similar accident at the Borssele nuclear reactor -- which is of the same type -- could not have led to the same consequences as in the nuclear reactor at Harrisburg.

For example, the auxiliary water feeding system in Borssele is triple, while that in the U.S. was double.

The test frequency of the auxiliary system in the reactor at Harrisburg is once per 3 months, and in Borssele once per 3 weeks. Moreover the supply of cooling water in Borssele is much larger than that at the Harrisburg reactor. Because of this the chance that the reactor boils dry is smaller. In contrast to the American nuclear reactor, the various systems in Borssele shut off automatically, while those at Harrisburg work mostly via manual control. Also, it turned out that radioactive water from the nuclear

reactor there could flow directly to an auxiliary area, something which is impossible in Borssele, according to the letter.

On the basis of the accident at the Three Mile Island nuclear reactor at Harrisburg, the letter concludes that the population in the surrounding area was exposed to radiation to only a very slight degree, so that there is no reason for anxiety for the health of those involved. For consequences on the long term there is a possibility that a maximum of 1 person in 2 million of neighboring inhabitants will die of cancer in the next 30 years. It is expected that over that same period 120,000 people of those 2 million will die of cancer from other causes, among which natural radiation.

Analyses of soil samples have demonstrated that no contamination of the soil took place. Also a great number of milk samples showed an increase of the iodine concentration in only a few cases. The personnel of the nuclear reactor at Harrisburg did not experience radiation higher than the legally allowed limit, according to the letter.

The letter does conclude that repairs to the nuclear reactor in the United States could possibly still last several years. For the Dutch situation, the letter gives a summary of existing regulations for the protection of the population in the event of an accident at a nuclear reactor. It may be concluded from exercises over the last 3 years that the involved officials, auxiliary services and measuring units can be alerted and brought in very rapidly, said the letter.

Further it is pointed out in the letter that warning arrangements have been agreed upon with Belgium as well as with the FRG with respect to the reporting of nuclear accidents. An alarm arrangement exists with the FRG with respect to the nuclear reactor in Dodewaard and the nuclear research center in Delft. With respect to the nuclear reactors in the Belgian Doel, west of Antwerp at about 5 kilometers from the border, a similar arrangement is being prepared. The letter further refers to existing consultation structures within the EC, the Nuclear Energy Agency (NEA) and the International Atomic Energy Agency IAEA in Vienna.

In the framework of the Progress Report, the Coal Report and the Electricity Report, the government will put up for discussion still this year the entire set of problems on energy, thus states the letter. In the Electricity Report an examination will be given of nuclear reactor accidents which have led to serious damage in the installation. Also the final NRC report on Harrisburg will be brought to the attention of the chamber. The government furthermore is preparing an instructional brochure on nuclear energy and radioactivity.

## GOVERNMENT INDICATES COMMITMENT TO NUCLEAR POWER

London THE GUARDIAN in English 7 Jun 79 p 1 LD

[Colin Brown and Michael Morris report: "Thatcher Ready To Commit UK to A-Power"]

[Text] The prime minister yesterday gave a strong indication that the government is on the threshold of a major commitment to nuclear power to provide Britain's energy when North Sea oil runs out. She indicated clearly that a decision would need to be taken soon.

Her hint came at the end of the final Conservative Euro-campaign press conference when she was enthusiastically recalling her visit on Tuesday to a plant producing enriched nuclear fuel at Tricastin, in the south of France. She was obviously impressed with French investment in nuclear energy.

Asked whether she would like to see a similar plant over here, Mrs Thatcher replied: "We have oil, gas and coal. We will have to take decisions soon about the long-term nuclear programme because you know it takes a very long time to get these stations designed and built."

"We have now to think what happens when North Sea oil is exhausted. We must replace North Sea oil by another source of energy. Instead of using the product of North Sea oil as it seems to be used to have a consumer boom on imports, we must use the product of North Sea oil to develop our own alternative industries."

Meanwhile, it was learned yesterday that two rival claims for the siting of Britain's first commercial demonstration fast reactor (CDR) have emerged--from north-east England and Doune Quay, in Scotland--much to the consternation of environmentalists who believe that if Britain does go ahead with the CDR there will be no money for developing alternative energy sources.

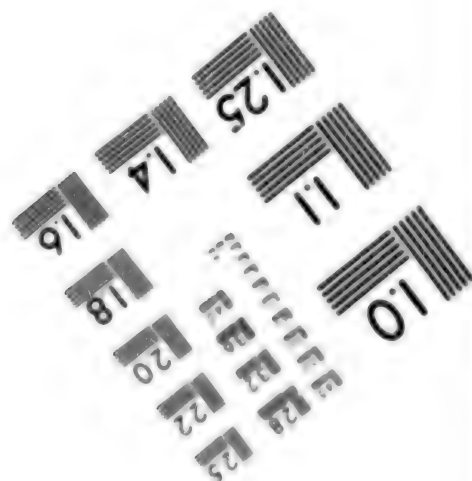
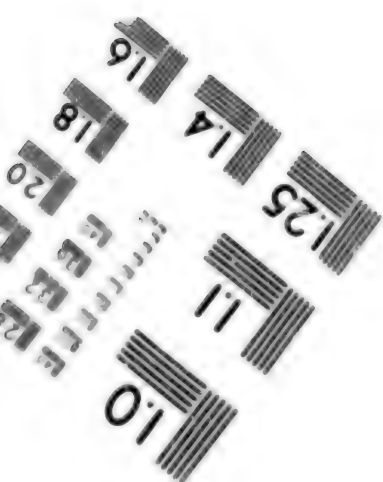
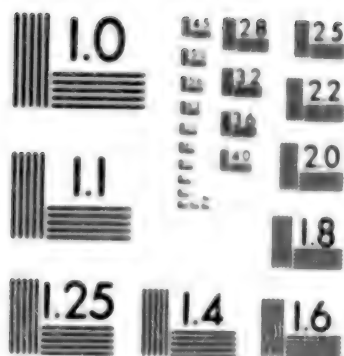
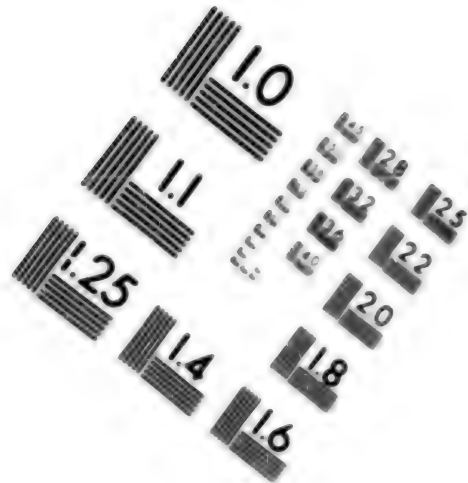
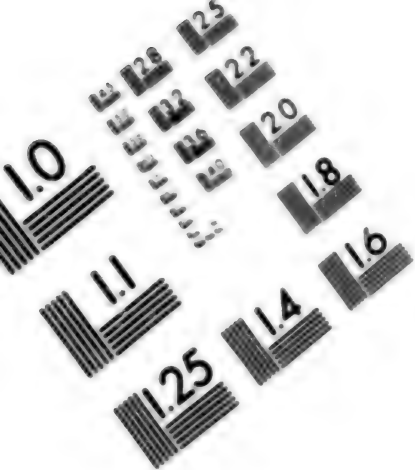
The CDR is now the main thrust of the UK atomic energy authority's research and development programme. The authority said yesterday that it was working in close collaboration with the CEGB, the nuclear installations inspectorate, and the rest of the nuclear industry in deciding how best to go ahead with the fast breeder.

The prototype fast reactor is at Doune Quay and the Highlands and Islands Development Board is pressing for the new commercial demonstration fast reactor to be built alongside it. But the northern economic planning councils are pressing the government for the fast reactor to be built in the north-east. However, the commercial demonstration fast reactor has yet to receive approval in principle. This is one of the factors that must have been in Mrs Thatcher's mind yesterday.

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**END**

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March 11, 1980



























